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Strength of Steel Maintained

Slowing Down of Buying Takes Little Pressure Off Mills from Bookings—Underlying Absorption of Material Is Tremendous—Production Continues at Top Speed and More Furnaces Resume—300,000 Tons of Rails Placed

SOME of the keen edge clearly is off the steel market making high premiums for special delivery more difficult to obtain, but the underlying demand is as heavy as ever and can only properly be described as enormous. It is this continuing unprecedented absorption of material that leaves the mills unconcerned over the quieter buying now being done and keeps them expectant of a renewal of active bookings after a certain lapse of time. Producers declare any tonnage freed by a slowing down of new building contracts or some lines of manufacture, can be immediately taken up elsewhere as there is a large unsatisfied demand still in sight.

Buyers generally are following cautious policies and not a few show apprehension over the outlook. Nothing of genuine weakness has developed in the steel situation, however, and there are various indications that the present wave of pessimism is being sharply overdone. Furthermore the recent halt in new buying is tending to better stabilize conditions.

Production is going ahead at top speed. In fact, the tendency to push it a shade higher as operating conditions will permit, still is shown reflecting the heavy obligations of tonnage which the mills are facing. The Illinois Steel Co. this week for the first time on record has all its 27 steelworks blast furnaces in commission. The Carnegie Steel Co. still has 53 of 59 furnaces active and would blow in two additional at Columbus were the crews available. Three additional merchant furnaces blew in this week. The general industry is producing steel at 92 or 93 per cent of capacity. High authorities in the industry hold that substantially the present rate of production may be considered assured into the fourth quarter.

Roads' Needs Are Huge

Railroad demand stands out as one of the market's highlights. Well-informed manufacturers estimate the railroads now are four years behind their normal requirements and that with active traffic conditions, sustained heavy buying from this source is to be expected. Rail demand for last half continues to expand and leading systems now have placed in excess of 310,000 tons with western mills for last half delivery. The Southern also has placed 30,000 tons. Because of the heavy demand for steel, as well as the relatively low price for rails, makers are not anxious for this kind of business at present. One road placed 52,000 tons of car material.

More Selling Being Done

Some of the larger producers who have been indifferent to new business in plates, shapes and bars now are more inclined to accept tonnage in these lines. This is not general, however. One explanation for this is that accumulated orders are beginning to be worked into under heavy shipments. Delivery promises on these new orders still are far deferred. In tin plate, wire and pipe the congestion still is such, additional tonnage is being declined. Single lots of as much as 200,000 boxes of tin plate for third quarter have been turned down by the Steel corporation particularly from container makers. Unfilled sheet tonnage grows.

While the tops are coming off the premium market, the minimum level as quoted by the Steel corporation and larger independents is firmly held. Independents are selling heavy tonnages of sheet bars for third quarter at $45.

The first decline since mid-December in IRON TRADE REVIEW composite of fourteen leading iron and steel products is shown this week, this being occasioned by the easing up of pig iron prices. The composite this week is $47.48 compared with $47.70 during the two weeks preceding.

Three open-hearth plants in the Mahoning valley are inaugurating 8-hour shifts as far as labor becomes available, supplanting the 12-hour term. Progress in this change is slow, however, owing to the scarcity of workmen.

Iron Shows Softness

Some softness in the pig iron market more plainly has appeared this week. Valley bessemer has been sold $1 lower and basic can be had at $29 or $2 under its recent top. Valley foundry and malleable also are easier. Reports are current of lower prices at Buffalo and one sale of No. 2X in New England was closed at $29. Elsewhere the iron market is very sluggish as buyers hold off from third quarter contracting but it is not weak.

Business Trend and Chart Section Page 1445

Softness Develops in Pig Iron

Valley Iron Available $1 or More Lower but Fair Sales Are Made—Prices More Uncertain at Buffalo and Some Other Producing Districts—General Market Still in Waiting Position Pending Third Quarter Buying

PITTSBURGH, May 15.—Continued softness in the pig iron market together with lack of buying interest has resulted in lower levels being inaugurated in connection with various grades, particularly steelmaking iron which is now being quoted at $29 to $30, valley for basic and at $30, valley for bessemer. The recent sale at $28 of 1000 tons by a middle interest of basic iron made in the Kittanning furnace has special features which remove it as a market factor. The $29, valley price would now be named by one or two producers if they were given firm offers of tonnage. A price of $30 was quoted this week by one producer on 3000 tons for July delivery to one of its regular customers in the Indiana territory. It is understood, however, that it will be necessary to cut the price in order to get the order. The reduction of $1 in bessemer is based on sales of single carloads or 100-ton lots and on quotations filed on the few inquiries current involving up to 250 tons at a time. Several small lots of malleable are up for attention from Ohio and Indiana consumers on which quotation. One or two producers have not made here whereas $31 has been the prevailing figure for some time past. It, in fact, has been the steady market quotation on bessemer, basic and malleable since about the middle of March. In connection with foundry iron, $30 to $31, valley is quoted on the No. 2 grade (1.75 to 2.25 silicon) with 50 cents or $1 being named for each additional 50 points of silicon. The $31 valley price has been obtained on two or three 200-ton lot sales but a buyer of tonnage could undoubtedly secure a $30 quotation. One or two producers have not changed their $31 base figure for the reason that so far they have not been called upon to do so. The Cambria Steel Co. division of the Bethlehem Steel Corp. is negotiating with its second quarter pig iron customers for a renewal of contracts for the third quarter period on a $31 f.o.b. Johnstown basis, the freight rate to Pittsburgh common points being the same as from the valley, $1.77. The Struthers Furnace Co. will blow in its furnace on foundry iron May 21 or 22. The Dunbar, Pa., furnace of the American Manganese Mfg. Co. was blown in yesterday afternoon on foundry iron. The Ella, Pa., furnace of the Reliance Coke & Furnace Co. is scheduled to be blown out June 10 after present ore supplies have been utilized. Similar action is contemplated by one or two other furnaces in the Pittsburgh district.

Buyers Still Cautious

Boston, May 15.—The growing caution among pig iron buyers is seen from the fact that a Connecticut consumer who inquired for 1200 tons for last half delivery has recently placed an order for approximately half this amount for third quarter and postponed action on the balance. Buying in New England is still meager and price cutting has been reported on the part of three or four furnace interests. On the other hand, some furnaces which have been low are now either out of the market or on a higher level, and a reluctance to meet the lowest prices is expressed by the majority of the furnaces usually supplying New England. A sale of 500 tons of No. 1X, (2.75 to 3.25) silicon, at $34.65 delivered, was made during the week. This is an iron taking an eastern Pennsylvania freight rate which brings the furnace price to $31. A 200-ton lot of No. 2X Buffalo iron, (2.25 to 2.75 silicon) was placed at $33.92 delivered or $29 furnace, but other Buffalo sales of No. 2X iron were made at $1 above this figure. Buying for third quarter delivery still holds off, yet close observers are confident that a heavy tonnage is still to be placed. Foundries generally have well filled order books for castings and production in most cases is limited only by the labor situation. A survey of the district points to a slight reduction in rate of melt during the past week. Stocks of iron in foundry yards are low and the rate of melt is thought to be greater than the rate of delivery from furnaces.

New York Market Sluggish

New York, May 15.—Sluggish buying continues to characterize the pig iron market here. Current demand is restricted almost entirely to small lots for prompt and nearby shipment. During the past week a Connecticut consumer who inquired for 1200 tons for the last half closed for a part of this tonnage. Another consumer in this district now is inquiring for 600 tons for the third quarter and this is the largest inquiry now before the trade. It is estimated sales of the past week aggregated more than 2000 tons. As a result of the large amount of business on their books, furnaces continue in a comfortable position so that the market reflects no weakness. Eastern Pennsylvania and New Jersey foundry continues to be quoted at $31, base furnace, plus $1 silicon differentials. Buffalo as well as central Pennsylvania foundry is quoted at $29 base furnace, plus 50-cent silicon differential. Virginia foundry for the third quarter now is $29 base furnace plus 50 cents silicon differentials for silicons up to 3.25 per cent, while the differential is $1 in the case of higher silicons. Virginia foundry for nearby shipment continues $28.50, base furnace, plus same differentials. Moderate lots of English copper-free low phosphorus iron have been sold during the past week at $35 duty paid tidewater.

Concessions Are Denied

Buffalo, May 15.—Customers have covered extensively for third quarter and only light fourth quarter inquiry is in sight. It totaled 2500 to 3000 tons for the week. Reports from New England of No. 2 plain (1.75 to 2.25 silicon), selling for $29 are unverified. All producers insist that no No. 2 iron has been sold below $29.50. Some high sulphur iron, analyzing 6½ to 7½ per cent has been sold for $29.25 and it is believed some No. 2X foundry, (2.25 to 2.75 silicon) has been sold for $29.50, but the base price has not been dropped. The Bethlehem Steel Co., here, has eight out of nine furnaces in blast, leaving only two furnaces unlighted in the district.

Market Still Drifting

Cleveland, May 15.—Within a period of less than 45 days from the third quarter the pig iron market still is drifting, and sellers are a little puzzled over the outlook in some directions. Certain features present strong contrasts, as the furnaces at Cleveland, Toledo and Detroit are sold to the point where they are not seeking business, while Buffalo, valley and southern furnaces have yet considerably iron to sell for the third quarter. Makers believe that if any weakness develops it will be at Buffalo, as at the beginning of the buying for second quarter, or in southern Ohio. There are rumors that offerings have been made below recent levels quoted at Buffalo and Ironton, but nothing to substantiate them. Lake furnace interests whose trade may be affected are prepared to meet any such competition immediately. The general belief is that some of those furnaces recently blown in and without backlogs will quote lower prices in order to induce buying for the third period, but this is expected to have only a temporary effect on the market. The only indication of weakness at present is that some furnaces east and south of Cleveland are endeavoring to sell iron to users who are unwilling to buy. The Cleveland furnace active in the market a few weeks ago has closed for practically all of its third quarter output; while the other furnace interests will not be much of a factor in this district if its steel mill connection continues to operate at the present rate, near capacity. The lake furnaces west of Cleveland are 75 to 85 per cent booked and are not seeking business. One of the lake furnaces booked 4000 tons additional in the week at $31.50 for local and $31 for outside delivery, this tonnage containing two lots in excess of 1000 tons, and all for the third quarter. There now is a dearth of inquiry not in excess of 1000 tons. Another lake furnace interest sold 1000 tons from its various furnaces. Cleveland users needing spot lots must again inquire at Buffalo, or in the valley, and there is no change in recent quotations. A carload of iron has been ordered from Buffalo by one local melter. The market here for iron delivered from outside still is quotable at $32.15 to $32.75. The market is not tested. Shipping instructions continue to call for large tonnages; one representative interest here reports that so far in May more iron has been ordered than in any similar period in the past

year and a half. A very large consuming interest in Cleveland has not yet closed for any iron for the third quarter. No inquiry or sales of basic iron are reported.

Southern Ohio Market Quiet

Cincinnati, May 15.—With most consumers of pig iron covered for second quarter requirements the market at Cincinnati is quiet, except for occasional small lots of spot iron. Interest in third quarter delivery continues moderate and consumers are not buying heavily. Some price shading has been done but this practice is not general. A producer is offering a limited tonnage of northern iron at $30, Ironton base. The southern Ohio market continues steady at $31 to $32, Ironton base, while the southern market is firm at $27, Birmingham base, except that one producer is asking $28, base, on the higher silicon grades. Sales during the past week include 300 tons of northern iron to a mine car manufacturing concern at Charleston, W. Va., and two lots of 8 per cent silvery iron of 50 and 150 tons. An inquiry for 500 tons of bessemer iron for third quarter is now current and is about the only business of size now in sight. It seems likely that the regular buying movement for third quarter delivery will start about June 1 and some of the larger users are now inquiring tentatively.

Press for Deliveries

St. Louis, May 14.—While all users with pig iron purchased are pressing for deliveries, new buying continues practically dead. The only sales negotiated were a few scattered car lots. Absolutely no interest in third quarter requirements is in evidence. Stocks with a number of the more important melters are light, and they will not be able to put off replenishing much longer if the present rate of consumption continues.

The only inquiry of any size reported was from a Kansas melter for 1000 tons of foundry iron, either northern or southern 2.25 to 2.27 per cent silicon, for delivery through August, September and October. Prices are holding quite firm in face of the lack of demand. No. 2 southern is held at $28, and $32 to $33 is quoted on northern iron of the same grade. The leading local producer is still asking $33 to $34 f.o.b. Granite City. This interest, which has been working on foundry and malleable recently, has reverted to basic.

Both mills and foundries report a decided slowing down in new orders during the past three weeks. Most of them, however, have orders booked which will keep them occupied for some weeks to come. Stove plants in all sections of the district keep active. Sales of farm implements for the season to date are about 65 per cent in excess of the corresponding period last year.

New Sales Are Small

Birmingham, Ala., May 14.—New buying of pig iron is slow but the market continues strong, and there is full production and heavy delivery. The rate of output is around the peak. One more blast furnace is scheduled for operation soon in addition to the one the Sloss-Sheffield Steel & Iron Co. has just started. The former is the Sheffield furnace recently purchased by the Sloss-Sheffield company. It will be ready for operation in 30 days. A little

(*Continued on Page* 1424)

Prices of Coke Again Cut

Spot Furnace Fuel Down to $4.50. Foundry Grade at $6. Minimum Figures—Demand Light. Further Curtailment Planned

COKE PRICES, PAGE 1424

Pittsburgh, May 15.—As spot beehive furnace coke is quoted today at $4.50 in lots of five to 15 cars at a time, the spread of the market has widened. A quotation of $6 remains as the maximum. The minimum has been reduced 50 cents from what it was one week ago. Some producers, however, state they will not lower their $6.50 quotation on third quarter contracts. Numerous quotations of $6 are out on first quality furnace coke for delivery over that period to several furnace operators who continue to negotiate for fuel. Since $6 was the basis of the last contract taken, as reported in IRON TRADE REVIEW May 10, that of the Inland Steel Co. involving about 9000 tons a month for six months from June 1, the market is considered quotable at $4.50 to $6. The Inland company originally asked for 250 tons daily but closed on 300 tons for the six months. One blast furnace operator in this district bought 1000 tons of standard fuel last week for filling in purposes at $4.50, ovens. Several spot sales involving up to 15 carloads at a time are noted at $4.75, although $4.50 is being quoted today. One contract for medium sulphur coke was taken several days ago at $4.75 for three months, but the International Nickel Co. has just closed on 5000 tons at $4. No inquiries are out for export coke, and sales are at a standstill. The foundry coke market is quiet, and while some single carload quotations are out at $7.50, the regular market is quotable at $6 to $7 or 50 cents under the level prevailing a week ago. Sales are small and inquiries are scarce. Some of the larger users are beginning to be interested in their third quarter requirements but are postponing action as long as possible. Further curtailment of coke oven operation to a 3 or 4-day per week basis pobably will be made since production appears to be so far in excess of current demand. This with an increasing car shortage as the lake coal season advances is expected to result in higher coke prices 30 or 60 days hence. Production according to the *Connellsville Courier*, for the week ended May 5 advanced to 306,200 tons from 302,720 tons, the preceding week.

Foundry Coke Down to $6.50

New York, May 15.—Softness continues to be reflected in the price of foundry coke. Standard beehive foundry for spot shipment has been sold as low as $6.25, Connellsville. At present the minimum appears to be $6.50. Special brands are bringing in some cases as high as $7.50, Connellsville. Included in the business of the past week was a fair size tonnage of foundry coke in the aggregate for the second half, which went at $8, Connellsville.. A special brand was involved in this business. The Seaboard By-Products Coke Co. continues to quote $12.34 to $12.41 delivered at Newark and other northern New Jersey points for by-product foundry coke.

New England Shipments Improve

Boston, May 15.—Freight conditions between the Connellsville district and New England have greatly improved and as a result many foundrymen in the southern part of the district are taking advantage of the lower beehive prices for foundry fuel. Request for shipments from the by-product ovens in New England continue without appreciable change, but practically no new buying has taken place during the past week. The price of by-product fuel is unchanged at $15 and $16, delivered. Connellsville coke is selling at $14, delivered.

Distress Coke Affecting Market

Cincinnati, May 15.—The coke situation in this district is easier than in a number of months. Offerings from all sources are more plentiful and shipments from the East and South are coming through with fair regularity. The most important transaction in the market during the past week was the sale of 25 cars of Connellsville furnace coke to a central Ohio user for prompt delivery. The price was $5.25, ovens. A similar amount based on the same price and for immediate delivery is pending. Sellers report that the large volume of "distress" coke thrown on the market is affecting the spot situation. The quietness of the market is largely due to the fact that users are covered for 60 to 90 days. By-product plants are being operated at capacity.

Fewer Southern Offerings

St. Louis, May 14.—About the only feature of interest in the coke market is that dealers are contracting for domestic requirements through to next March. This business has been fully taken up to expectations. Prices range from $9.50 to $10.50. Offerings of southern coke have fallen off since May 1, and the price holds steady at $8.50, Birmingham. Connellsville interests are offering more freely, and recent contracts have been on a basis of $5 to $6 for the furnace grade, and $6.50 to $7.50 for foundry. The coal market has improved and slight advances from the low point are noted on certain grades. Extreme quietness prevails. On May 1, retail prices on Carterville coal advanced, and the new prices are: Carterville $7.75; Mt. Olive $6.50; Standard $5.75, and smokeless $14.50.

Production Continues Heavy

Birmingham, Ala., May 14.—Production of coke is being kept at the peak and transportation companies are being urged to give the best service possible. New sales are confined to small lots. Local consumption is very heavy, a price of $8.50 is obtained for beehive and by-product foundry coke in this section.

Softness Develops In Iron

(*Continued from Page* 1423)

more interest is noted in the market. Inquiries are being made for iron, some as far ahead as the latter part of the year. Scarcity of labor and high wages are factors in the increasing cost of production, and the higher costs of raw material and labor are causing an increase in other products, though so far there is no decrease in consumption of pig iron. Building operations show no letup in the demand for radiators, cast iron sanitary pipe and fittings and small hardware. Railroad betterments are being made, and other development work is well under way. Price is held at $27 for No. 2 foundry. Little spot selling is reported. A little buying is heard of occasionally involving 300 to 500 tons. The last large sale was 10,000 to 20,000 tons, to the United States Cast Iron Pipe & Foundry Co. The few sales made for delivery during the last quarter of the year were on a basis of $27 per ton.

Chicago Market More Active

Chicago, May 15.—Demand for pig iron is increasing, both for spot and third quarter delivery. Sales for the third quarter now are greater than at the corresponding time for the second quarter and furnaces have a good backlog. Sales are made at $32 for third quarter and $32 to $33 for prompt iron, according to delivery point. Southern iron still is $27, Birmingham. Labor shortage is hampering the foundry melt, but this is not holding up shipments. Sales are relatively small, in tonnages of 100 to 500 tons, divided equally between northern and southern iron. Inquiry includes 300 tons of southern charcoal iron. Superior charcoal iron is unchanged and most of the inquiry is from the East. Low-phosphorus iron is not in demand. Silveries are unchanged. The sale of a few carloads is noted.

Eastern Buying Still Light

Philadelphia, May 15.—Pig iron demand here continues small the principal demand involves 12,000 tons of foundry and bessemer iron for third quarter for a south Philadelphia plant. The also is an inquiry for a good tonnage of low phosphorus iron. Despite the absence of any business of size the market continues firm, Eastern foundry iron still is $31, base furnace, plus, $1 silicon differentials. Copper bearing low-phosphorus iron continues at $33. It is reported that in addition to the domestic copper-free iron sold recently at $32, furnace, some tonnage has been sold slightly lower. This is not confirmed. Slightly more than 1000 tons of English copper-free low-phosphorus iron was sold in the week at $35 duty paid, tidewater. Basic iron is featureless.

The M. & W. Co., Springfield, Mass., maker of electric lamps, has purchased two of the former Knox Motors Co. buildings in that city for $118,000.

Wins Rail Rate Decision

Washington, May 15.—The Parkersburg, Rig & Reel Co., Parkersburg, W. Va., has won an important decision over the Pennsylvania railroad in regard to freight rates on iron and steel articles to Parkersburg. The interstate commerce commission has ruled that rates from Portsmouth, O., shall not exceed the contemporaneous rates from Pittsburgh, that the rates from Johnstown and Connellsville, Pa., shall not top the Pittsburgh rate by more than 2 cents. The rates from Monessen, Pa., shall be the same as those from Johnstown and Connellsville according to the interstate commerce commission ruling.

Fluorspar Interest Low

Pittsburgh, May 15.—With but a few sales recorded from time to time, the fluorspar market remains dull as it has been for a few weeks past. Shipments continue fairly heavy, however, on contracts, many consumers like the American Radiator Co. being fully covered on their first half requirements. Any small sales that are consummated apparently carry figures below the $21.50 market quotation on guaranteed material since those sellers quoting that figure report no selling activity whatever. Hence, the $21.50 f.o.b. mine quotation largely is nominal.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	May 16, 1923	April 1923	Feb. 1923	May 1922
PIG IRON				
Bessemer, valley, del., Pitts....	$31.77	32.77	29.57	26.46
Basic valley	30.00	31.00	26.10	24.50
*No. 2 foundry, del. Pittsburgh	31.77	32.77	28.77	25.71
*No. 2 foundry, Chicago	32.50	32.50	29.75	20.00
Lake Superior charcoal, Chicago	36.65	36.55	33.55	26.90
Malleable, valley	30.00	31.00	27.25	24.50
Malleable, Chicago	32.50	32.50	29.75	20.00
*Southern No. 2, Birmingham..	27.00	27.00	24.50	17.60
*Southern Ohio, No. 2, Ironton	31.00	31.00	28.40	22.70
Basic eastern del., eastern Pa..	30.75	30.75	28.15	24.55
**No. 2X, Virginia furnace ...	29.00	29.25	27.50	23.50
**No. 2X, eastern del., Phila..	32.76	32.76	30.10	25.60
Gray forge val., del. Pittsburgh	31.27	31.77	27.87	25.46
Ferromanganese, del. Pitts.....	129.79	124.79	112.79	72.32
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	45.00	45.85	39.25	35.00
Sheet bars, open-hearth, Pitts..	45.00	45.85	39.25	35.00
Billets, bessemer, Pittsburgh ...	45.00	46.00	38.85	34.50
Billets, open-hearth, Pittsburgh..	45.00	46.00	38.50	34.50
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.40	2.35	2.15	1.60
Steel bars, Chicago	2.50	2.43	2.21	1.56
Steel bars, Philadelphia	2.825	2.825	2.525	1.96

	May 16, 1923	April 1923	Feb. 1923	May 1922
FINISHED MATERIAL (Continued)				
Iron bars, Philadelphia.....	$2.825	2.875	2.45	1.96
Iron bars, Chicago mills.....	2.60	2.60	2.46	1.58
Beams, Pittsburgh	2.50	2.45	2.15	1.60
Beams, Philadelphia	2.925	2.85	2.525	1.96
Beams, Chicago	2.60	2.53	2.31	1.58
Tank plates, Pittsburgh	2.50	2.45	2.15	1.60
Tank plates, Philadelphia	2.925	2.95	2.525	1.96
Tank plates, Chicago.....	2.60	2.53	2.31	1.58
Sheets, blk., No. 28, Pittsburgh.	3.85	3.85	3.35	3.15
Sheets, blue anl., No. 10, Pitts.	3.00	3.15	2.50	2.40
Sheets, galv., No. 28, Pittsburgh	5.00	5.00	4.35	4.15
Wire nails, Pittsburgh.....	3.00	3.00	2.75	2.40
COKE				
Connellsville furnace, ovens.....	4.50	6.25	7.20	6.90
Connellsville foundry, ovens.....	6.00	7.80	8.60	6.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	22.50	25.85	23.40	17.00
Heavy melting steel, eastern Pa.	20.00	23.50	21.20	15.15
Heavy melting steel, Chicago....	19.00	22.40	19.75	12.05
No. 1 wrought, eastern Pa. ...	24.50	27.00	24.10	17.00
No. 1 wrought, Chicago.....	19.25	22.75	20.50	12.25
Rails for rolling, Chicago.....	21.00	23.65	22.00	12.85

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Composite Market Average

Composite Market Record by months for Nine Years on Page 1348

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months One Year and Ten Years Ago

May 16, 1923	May 9, 1923	April, 1923	February, 1923	May, 1922	May, 1913
$47.48	$47.70	$47.01	$42.61	$36.49	$27.34

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 1494, WAREHOUSE PAGE 1486, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1490

Pig Iron

Bessemer, valley	$30.00
Bessemer, Pittsburgh	31.77
Basic, valley	29.00 to 30.00
Basic, Pittsburgh	30.77 to 31.77
Basic, Buffalo	29.50
Basic, del., eastern Pa.	**30.50 to 31.00**
Malleable, valley	30.00 to 31.00
Malleable, Pittsburgh	31.77 to 32.77
Malleable, Chicago	32.00 to 33.00
Mallebale, Buffalo	**30.00**
Malleable, del., eastern Pa.	33.00 to 33.50

FOUNDRY IRON SILICONS

No. 2 Northern	**1.75 to 2.23**
No. 2 Southern foundry.	**1.75 to 2.25**
No. 2X East'n and Virginia	**2.25 to 2.75**
No. 1X Eastern	**2.75 to 3.25**
No. 1 Chicago	**2.25 to 2.75**
No. 2 foundry Eastern	**1.75 to 2.25**

No. 1X, eastern del., Phila.	**34.01 to 34.26**
No. 1X, Buffalo	**30.50 to 31.00**
No. 2 foundry, valley	30.00 to 31.00
No. 2 foundry, Pittsburgh	31.77 to 32.77
No. 2 foundry, Buffalo	**29.50**
No. 2 foundry, Chicago	32.00 to 33.00
No. 2 foundry, Granite City	**33.00 to 34.00**
No. 2 foundry, Ironton fur.	**31.00 to 32.00**
No. 2 foundry, Cleveland del.	**32.15 to 32.75**
No. 2 foundry, del. Phila.	**31.76 to 32.13**
No. 2 foundry, N. J. tidewater	**32.13 to 33.28**
No. 2X, eastern del., Phila.	**32.76 to 33.13**
No. 2X, east. N. J., tidewater	**33.13 to 33.78**
No. 2X, eastern del. Boston	33.65 to 34.15
No. 2X foundry Buffalo fur.	**30.00**
No. 2X, Buffalo, del. Boston	33.42 to 34.92
No. 2 southern, Birmingham	**27.00**
No. 2 southern, Cincinnati	**31.05**
No. 2 southern, Chicago	**33.01**
No. 2 southern, Philadelphia	**33.80**
No. 2 southern, Cleveland	**33.01**
No. 2 southern, Boston (rail and water)	**34.41 to 34.91**
No. 2 southern, St. Louis	**32.17**
No. 2X, Virginia furnace	**29.00 to 29.50**
No. 2X, Virginia, Phila.	**34.27 to 34.77**
No. 2X, Virginia Jersey City	**34.54 to 35.04**
No. 2X, Virginia, Boston	33.92 to 34.92
Gray forge, eastern Pa.	**29.00 to 30.50**
Gray forge, val., del. Pitts.	31.27 to 31.77
Low phos., standard, valley	**36.00**
Low phos., standard, Phila.	35.75 to 37.00
Low phos., Lebanon furnace.	**33.00**
Charcoal, Birmingham	34.00 to 35.00
Charcoal, Superior, Chicago.	**36.65**

Silvery Iron

Jackson County Ohio, furnace

8 to 9 per cent	**$39.50**
9 to 10 per cent	**41.50**
10 to 11 per cent	**43.50**
11 to 12 per cent	**46.50**
12 per cent	**48.50**
13 per cent	**51.00**

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	**$48.50**
11 to 12 per cent	**51.80**

Ferroalloys

per cent, domestic, seaboard of furnace	**$120.00 to $130.00**
Ferromanganese, delivered, Pittsburgh	**129.79 to 139.79**
†Ferromanganese, 79 per cent, English, c.i.f. seaboard.	**125.00 to 135.00**
Spiegeleisen 19 to 21 per cent furnace or tidewater, contract	45.00 to 47.50
Spiegeleisen 19 to 21 per cent furnace or tidewater, spot	50.00 to 55.00
Ferrosilicon, 50 per cent contract freight allowed	**95.00 to 97.50**
Ferrotungsten standard, per pound contained	**92.50 to 97.50**
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, delivered	**12.00**
Imported ferrochrome, 4 to 6 per cent carbon	**12.00**

†Duty paid.

Ferrovanadium, 30 to 40 per cent per pound estimated, according ton analysis	**$3.50 to $4.00**
Ferro carbon-titanium, carloads, producers plant, per net ton	**$200.00**

Coke

Beehive, Ovens

Connellsville furnace	$4.50 to 6.00
Connellsville foundry	6.00 to 7.00
New River furnace	9.50 to 10.00
New River foundry	13.00 to 14.00
Wise county furnace	7.00 to 7.50
Wise county foundry	8.00 to 8.50
Alabama furnace	**7.50 to 8.00**
Alabama foundry	8.00 to 8.50

By-Product

Foundry, Newark, N. J., del.	$12.34 to $12.41
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill.	14.00
Foundry, Alabama	8.00 to 8.50

Semifinished Material

BILLETS AND BLOOMS

4 x 4-inch base

Open-hearth, Pittsburgh	$42.50 to 47.50
Open-hearth, Youngstown	42.50 to 47.50
Open-hearth, Philadelphia	50.17
Bessemer, Pittsburgh	42.50 to 47.50
Bessemer, Youngstown	42.50 to 47.50
Forging, Pittsburgh	55.00 to 58.00
Forging, Philadelphia	60.17

SHEET BARS

Open-hearth, Pittsburgh	$45.00 to 47.50
Open-hearth, Youngstown	45.00 to 47.50
Bessemer, Pittsburgh	45.00 to 47.50
Bessemer, Youngstown	45.00 to 47.50

SLABS

Pittsburgh	$42.50 to 47.50
Youngstown	42.50 to 47.50

WIRE RODS

¼-inch and finer

Wire rods, Pittsburgh	$51.00 to 55.00

SKELP

Grooved skelp, Pittsburgh	2.50c to 2.65c
Universal skelp, Pittsburgh	2.50c to 2.65c
Sheared skelp, Pittsburgh	2.50c to 2.65c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.50c to 2.65c
Structural shapes, Phila.	2.825c to 2.975c
Structural shapes, New York	2.84c to 2.99c
Structural shapes, Chicago	**2.60c to 2.75c**
Tank plates, Pittsburgh	2.50c to 2.60c
Tank plates, Philadelphia	2.825c to 2.975c
Tank plates, New York	2.84c to 2.99c
Tank plates, Chicago	**2.60c to 2.75c**
Bars, soft steel, Pittsburgh	2.40c to 2.50c
Bars, soft steel, Philadelphia	2.725c to 2.825c
Bars, soft steel, New York	2.74c to 2.84c
Bars, soft steel, Chicago	**2.50c to 2.75c**
Bars, refined iron, Pittsburgh	**3.15c to 4.85c**
Bars, rail steel, Chicago	**2.30c to 2.40c**
Reinforcing bars, Pittsburgh	2.40c to 2.50c
Bar iron, common, Phila.	2.825c to 2.925c
Bar iron, common, New York	2.84c to 2.94c
Bar iron, common, Chicago	2.60c to 2.75c
Bars, forging quality Pittsburgh	2.65c to 2.75c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	3.30c to 3.50c
Hoops, Pittsburgh, small	3.75c to 4.00c
Bands, Pittsburgh	3.30c to 3.50c
Cold finished steel bars, Pittsburgh base	**3.25c**
Steel shafting, Pittsburgh	3.25c
Cotton ties, bundle 45 lb. Pittsburgh	$1.90

Rails, Track Material

Standard bessemer rails, mill	**$43.00**
Relaying rails, St. Louis	30.00 to 39.00
Relaying rails, Pittsburgh	30.00 to 34.00
Light rails, 25 to 45, mill	2.25c
Angle bars, Chicago base	**2.75c**
Spikes, railroad, Pittsburgh	3.15c
Spikes, small railroad, Pitts.	3.75c
Spikes, boat and barge, Pitts.	3.50c to 3.75c
Spikes, railroad, Chicago	3.25c
Track bolts, Pittsburgh	4.25c to 5.50c
Track bolts, Chicago	4.25c
Tie plates, Pittsburgh	2.60c to 2.75c
Tie plates, Chicago	2.60c

Spike, tie plate and track bolt prices for carlots.

Wire Products

To Jobbers in Carloads

Wire nails, Pittsburgh	3.00c to 3.10c
Plain wire, Pittsburgh	2.75c to 3.00c
Annealed wire, Pittsburgh	2.90c to 3.20c
Galvanized wire, No. 9 gage, Pittsburgh	3.35c to 3.60c
Barbed wire, painted, Pitts.	3.45c to 3.70c
Barber wire, galv., Pittsburgh	3.80c to 4.05c
Polished staples, Pittsburgh	3.45c to 3.65c
Galvanized staples, Pittsburgh	3.80c to 4.05c
Coated nails, count keg, Pitts.	2.70c to 2.75c
Woven wire fencing (retailers)	65 off
Woven wire fencing (jobbers)	67½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.50c
Sheet piling base, Pittsburgh	2.55c to 2.65c
Hot rolled strip steel, Pittsburgh stamping quality	**3.30c to 3.50c**
Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100-inch and heavier, base	**5.25c to 5.50c**

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	3.85c to 4.15c
No. 28, bessemer, Pitts.	3.85c to 4.15c
No. 28, open-hearth, Phila.	4.175c to 4.325c
No. 28, open-hearth, Chicago.	4.19c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	3.85c to 4.15c
No. 28, open-hearth, Chicago.	**3.84c to 4.34c**

GALVANIZED

No. 28, open-hearth, Pitts.	5.00c to 5.50c
No. 28 bessemer, Pittsburgh	5.00c to 5.50c
No. 28, open-hearth, Phila.	5.325c to 5.575c
No. 28, open-hearth, Chicago	5.34c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.00c to 3.35c
No. 10, bessemer, Pittsburgh	3.00c to 3.35c
No. 10, open-hearth, Phila.	3.325c to 3.575c
No. 10, open-hearth, Chicago	3.34c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	5.35c to 7.00c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$5.50 to $6.00

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	61 to 62	49½ to 50½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Less Carload Discounts—Carloads 4 Points More

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch	35

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	61.20 to 63.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	53.00 to 54.00
Six-inch and over, Birmingham	49.00 to 50.00
Four-inch, New York	63.60 to 65.50
Six-inch and over, New York	59.00 to 60.00
Three-inch, Birmingham	59.00 to 60.00

Class A pipe is $5 higher than Class B.

Standard fittings, Birmingham, base. $110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Scrap Lacks Strength

Consumer Buying Still Limited and Prices Decline Further—No Shortage of Material—Some Dealers Think Market Bottom Reached

SCRAP PRICES, PAGE 1494

Chicago, May 15.—Declines of $1 to $2 per ton in quotations on iron and steel scrap have taken place during the past week at Chicago. Practically every grade has suffered in varying degree and the list averages close to $2 under the level of a week ago. Some small buying of heavy melting steel has been done recently, one user taking about 2000 tons. While heavy melting steel is quoted at $19 to $19.50 per gross ton, some dealers with contracts expiring shortly have paid $20 for this grade for quick shipment. Rolling mills and foundries are buying little scrap and through the entire list demand is slow. An unusual tonnage of railroad scrap is coming into the market and this is assisting in keeping the supply heavy. The Chicago Great Western railroad offers 1000 tons, the Santa Fe railroad 3000 tons, the Rock Island 6500 tons, the Wabash 5200 tons, the Northern Pacific 3000 tons, the Chesapeake & Ohio 8100 tons, the Norfolk & Western 7000 tons, the Southern railroad 6000 tons, the Soo Line 650 tons, the Elgin, Joliet & Eastern 500 tons and the Texas & Pacific 600 tons.

Steel Moves to Pennsylvania

Boston, May 15.—Demand from Pennsylvania steelmakers for heavy melting steel has improved slightly during the week and a much heavier tonnage has moved out of New England than heretofore. This is due largely to an increased desire on the part of yard owners to liquidate stocks. Several round tonnage lots have changed hands at $15.50 shipping point which means about $20.50 delivered to eastern Pennsylvana consumers. Cast grades are sluggish and such sales of No. 1 cast as have been made have been at from $25 to $26 delivered. Stove plate is a drug on the market. Connecticut consumers of malleable scrap recently have been in the market and inquiries for 500 tons and 200 tons have been circulating. This grade of scrap is scarce and it takes unusually high prices to secure a round tonnage lot. It is reported the 500-ton lot was closed at close to $30 delivered. The Boston Elevated railway sold a heavy tonnage of miscellaneous scrap during the past week including 100 tons of rolled steel wheels, 150 tons of girder rail castings and tie plates and several hundred tons of bolts, lags and shims.

Think Price Bottom Near

New York, May 15.—The bottom of the present downward movement in scrap is believed near, and while no particular strength is likely to be displayed throughout the summer months, at least a period of steadiness is expected to prevail. During the past week prices on heavy melting steel dropped off 50 cents on No. 1 railroad steel, $1, these two grades now being on the same level for the first time in months. Dealers are now buying at $16 to $16.50, f.o.b. New York. Declines have also been made in wrought pipe, which is now holding at $13 to $13.50, New York, and in grate bars, $17 to $17.50, a drop of $1 in both instances. Other grades are weak but unchanged. Notwithstanding the softness of the market, between 50,000 and 60,000 tons of heavy melting and No. 1 railroad steel have been closed within the past week to 10 days. Recent buyers include Bethlehem, which has been closing at $19, delivered; Lukens, $20; Alan Wood, $20; Worth, $20; and in the Pittsburgh district, consumers at Midland and Monessen, $22 being paid for shipments to both points.

New Buying At Standstill

Pittsburgh, May 15.—New buying of iron and steel scrap is practically at a standstill and material on order is not beng accepted. This has caused even dealer buying to cease for the time being. Purchases for yard stocks stopped some time ago. Lists of scrap that now become available attract but minor attention. While heavy melting steel is quoted at $22.50 to $23, it is impossible to obtain the $23 figure and the next sales doubtless will be around $22. Practically no inquiries are current and sales involve such small amounts as to be unimportant from a market standpoint, almost always below 1000 tons. Even these are few since only at times do needs develop which cause buyers to enter the market. Predictons are freely made that the scrap market will sag to $20 and then react to a basis somewhat higher than the nominal market which exists at the moment.

Price Slump Continues

Buffalo, May 15.—With the market slumping $20 heavy melting steel is predicted by dealers before the end of the month. All grades on the list are affected in a substantial way by the falling off of demand. Dealers are active in purchasing to fill their high-priced orders, most of which must be in by the end of the month. Notice has been served by many consumers that unless deliveries are made promptly and within the time limit, they will be cancelled. Most consumers made their contracts on the basis of 60 days delivery about two months ago, and wide cancellations may be expected unless the material is delivered as per schedule. Rejections of shipments are frequent.

Small Volume Moving

Cleveland, May 15.—Movement of iron and steel scrap in the Cleveland and Mahoning valley district is in small vol-

(*Concluded on Page* 1440)

Strip Books Not Opened

STRIP PRICES, PAGE 1424

Pittsburgh, May 15.—While order books of the strip steelmakers are not officially opened for the third quarter, some business is being taken which cannot physically be shipped before July and which may not be shipped before early August. Orders lately have involved good sized tonnages of both hot and cold-rolled and while some subsidence of demand has been noted so far this month, it is expected to compare favorably with the April bookings which were fully as heavy as those of March. Cold-rolled strips continue to be quoted at 5.25c to 5.50c while hot-rolled is unchanged at 3.30c to 3.50c. Some of the exceedingly narrow sizes and thin gages bring still higher figures than that maximum.

Spiegel Higher

Sales Made At $45 to $47.50 Furnace —$120 Quoted On Ferromanganese

FERROALLOY PRICES, PAGE 1424

New York, May 15.—Spiegeleisen prices have been advanced. Sales of at least 1200 tons of 20 per cent metal have been made for shipment over the last four months of this year at $45 to $47.50 furnace. There is a lively demand for spiegeleisen including lots up to 600 tons each, principally for prompt delivery, but also for shipment over the remainder of the year. Spot and nearby spiegeleisen is very scarce. The market on spot and nearby continues to be quoted nominally at $50 to $55 furnace, for 20 per cent metal.

Demand for ferromanganese over the past week has been very small. The market continues to be quoted at $125 duty paid tidewater for forward shipment and $130 for prompt and nearby shipment.

Several inquiries for ferromanganese from the western consuming district, including Chicago, have come out involving from single carloads up to 300 tons at a time. On these $130, seaboard base has been quoted by domestic producers.

All Metals Are Dull

Pittsburgh, May 15.—Prompt buying of ferroalloys is limited. Inquiries for ferromanganese are somewhat scarce, although several larger consumers now are figuring on their fourth quarter requirements. Some of these involve 1000 tons or more and they have received quotations as low as $120, seaboard base. As high as $130, seaboard base, still is being quoted on the domestic material, depending upon the quantity involved and the deliveries wanted. Practically no prompt demand is noted, although now and then a carload or larger inquiry comes out and is promptly closed up either by the sellers of British material or by the domestic producers at as high as $130, Baltimore, or $134.79, delivered Pittsburgh.

Other alloys are exceedingly quiet. Only occasional small lot inquiries appear for 50 per cent ferrosilicon, ferrotungsten, ferrovanadium, etc., and often premiums above the market quotations are obtainable because the amounts involved are so small.

The situation as regards spiegeleisen is unchanged. The Dunbar, Pa., furnace of the American Manganese Mfg. Co., was blown in Monday on foundry iron. Possibly at a later date it will be turned over to spiegeleisen.

Spiegeleisen Strong

Chicago, May 15.—Spiegeleisen is scarce and strong. Sales of carloads of prompt material at $58, delivered at Chicago, are noted. Ferromangan-

ese sales include one of 300 tons and some carloads at $130, seaboard, for prompt delivery, and a carload for third quarter at $125, seaboard.

Labor Shortage May Cut Ore Production

ORE PRICES, PAGE 1490

Cleveland, May 15.—While shipments of iron ore from Lake Superior district have been retarded by ice, the delay has not grown to serious proportions, nor is it expected to do so in view of steady improvement in weather conditions. A number of cargoes have come through from the head of Lake Superior, but downbound and upbound vessels have been held up at Sault Ste. Marie.

A far more disconcerting development in the ore trade is the widespread shortage of laborers and miners in the Lake Superior district. One of the largest operating companies reports that its force is 25 to 30 per cent below requirements and that men have been taken off development work to dig for ore. Another large company states that there has been an exceptionally heavy turnover, due to men seeking employment at higher wages. The general increase of 10 per cent put in effect recently has not improved the situation. Many companies find production schedules interfered with. The rate of output per man is below expectations. The shortage of labor was forecast last winter, owing to the restriction on immigration and the fact that a large number of men moved out of the district during the dull period of 1921, and that forces were not recouped during 1922.

The Oliver Iron Mining Co., subsidiary of the Steel corporation, plans to ship 25,000,000 to 30,000,000 tons of ore this season. Its shipments normally average slightly less than 50 per cent of the total; in 1922, they were 45 per cent.

Furnaces generally have covered their requirements for the present and the market is quiet.

Negotiate Sheet and Tin Plate Wage Scale

Atlantic City, N. J., May 15.—Representatives of the Western Sheet & Tin Plate Manufacturers association are meeting here this week with the sheet and tin plate conference committee of the Amalgamated Association of Iron, Steel and Tin Workers to negotiate a new wage scale for the year beginning July 1. The conference began Monday.

It is reported that the rollers and roughers want a 10 per cent increase over the base scale, the matchers and doublers a 20 per cent increase, and the heaters 15 per cent increase. The crew also wants an increase over the present rate when sheets 40 inches or wider are on schedule. The extra man that is carried from April to October is wanted the year round, and another extra man is desired from the April-October period. The conference on the bar iron scale will not be held until after the sheet tin and tin plate scale is determined.

Name Semifinished Price

Valley Mills Quoting $45 on Sheet Bars, Billets and Slabs for Third Quarter—Prompt Offerings Made at Same Figure at Pittsburgh

SEMIFINISHED STEEL PRICES, PAGE 1424

Pittsburgh, May 15.—Several sellers of semifinished material are experiencing enlarged demands for open-hearth steel, billets, sheet bars and slabs, and while a few of them could sell bessemer steel they are unable to take the open-hearth business. One prospective purchaser of 2000 or 3000 tons of 1¼-inch billets now is considering the advisability of taking bessemer with a 0.20 to 0.30 content instead of the soft open-hearth steel he wanted. Numerous other billet requirements are going unsatisfied, as shown by the number of consumers endeavoring to locate mills able to take on their requirements of 100 or 200 tons to 2000 tons monthly. A fairly large aggregate tonnage of slabs likewise is up for acceptance. Some mills are able to command a premium for slabs of $1.50 or $2 per ton over the price of billets but the usual practice is to name the same figure on billets and slabs. A few sheet bar inquiries are going the rounds. They are for 1000 to 7000 tons.

One sale of sheet bars involving several hundred tons for July has been made by a middle interest. For the tonnage it paid $46 but its selling price is withheld. Another inquiry now is out here for 5000 tons of sheet bars for third quarter delivery on which the $46 price is quoted.

While nothing definite is obtainable here in the way of a quotation for July or for third quarter, it is generally understood that $45 will be the price since that is so easily obtainable, consumers themselves offering to pay that figure. Forging billets still are quotable at $55 although no transactions have recently been recorded. A few inquiries are out for about 200 tons at a time.

From $51 to $55, Pittsburg, still is quoted on wire rods, the maximum being considered the going market level by numerous independent producers who claim that would be their quotation if they had any tonnage to offer. A few sales involving up to 200 tons each recently were recorded on that basis. The $51 price is the nominal figure of the American Steel & Wire Co. on ¼-inch rods up to 5 gage. It is quoting $53.50 on larger sizes.

Intermittent interest still is manifested in skelp by pipe and boiler tube makers here and there, and several contracts are up for renewal. Up to 2.75c still is being quoted on skelp, although 2.50c to 2.65c, base Pittsburgh, is the general spread.

No Tonnage Available

Youngstown, O., May 15.—Sheet bars for third quarter delivery have been priced at $45, Youngstown, by one producer here. Sales against production for the period are heavy and as far as can be foreseen no tonnage from this source will be available for the open market. While the leading maker has not announced the price to govern third quarter semifinished business it is understood some action will be taken this month and that $45, Youngstown, probably will be named. Sheet bars for immediate rolling were offered this week at $45, Pittsburgh, by three mills in that district.

Third Quarter Bookings Heavy

Cleveland, May 15.—The principal maker of sheet bars, billets and slabs in this district is committed for a very large proportion of its third quarter output, but no definite prices have been quoted, prices to apply in accordance with those prevailing at time of delivery. There is an active demand for the three grades of material, and while no additional sales have been made for prompt delivery, the market generally is regarded as around $45, based on sales in the week at that figure, in the valley, and also offerings at that price at Pittsburgh.

Billet Sales Small

Philadelphia, May 15.—Current billet sales are small and the market is unchanged at $45, base Pittsburgh, for rerolling and $55 for forging quality.

Warehouse Orders Still in Large Volume

WAREHOUSE PRICES, PAGE 1486

Philadelphia, May 15.—Jobbers in iron and steel products here report last week's business the largest they have experienced since 1920. However, the 1920 record has not yet been approached. Prices are firm and unchanged.

Trading Continues Active

New York, May 15.—Aside from advances in cold-rolled materials reported last week, the local warehouse market is unchanged. While demand is not as heavy as last month, trading continues active, practically all lines moving freely. Prospects of the New Haven railroad lifting its embargoes May 19 are encouraging to jobbers, who have been having considerable difficulty getting shipments into New England. This will greatly alleviate the transportation problem which has been facing jobbers.

Prices Are Firm

Cleveland, May 15.—Prices for iron and steel products out of warehouse are firm at the quoted levels. While the volume of business is not quite as large as it was during the past few weeks, individual orders are as numerous, but are not quite as large. Considerable business continues to be declined by the leading interest due to the fact a labor shortage makes it unable to keep up to schedule with its cutting.

Creditors of the Standard Parts Co., Cleveland have been allowed 20 per cent disbursement on their claims by the federal court. This brings distributions to date up to 55 per cent of their claims of $9,619,430.

Bar Situation Less Tense

Consumers Modify Their Efforts To Add to Tonnages on Books—Consumption Is Increasing as Rapidly as Production

BAR PRICES, PAGE 1424

Chicago, May 15.—Following the campaign against excess buying and inflation, consumers of soft steel bars have modified their efforts to place further tonnage with mills and as a result the situation is much quieter. Sales are not as heavy as was the case up to a fortnight ago, but consumption of steel bars is increasing as rapidly as production is made larger. This is a true test of the situation and shows that consumers of steel bars are finding strong demand for the products in which they utilize their steel. It appears likely the summer may be quiet as far as steel buying is concerned, but active in the effort to make deliveries. Resumption of active buying in the fall is indicated by the plans of railroads, automobile builders and agricultural implement makers. Soft steel bars continue to be quoted at 2.60c, Chicago mills, by the leading maker, the independent mill being out of the market.

A fair demand for bar iron is being met, with sales running slightly in excess of production. Railroads are the largest users of this production with other classes of users taking their due proportion. The present quotation is 2.60c, Chicago mill, while up to 2.75c mill is done in some instances.

Rail steel bars are quoted at 2.30c to 2.40c, mill, and sufficient business is on mill books, to keep deliveries about four to six weeks into the future. Much of this material is being asked for concrete reinforcements.

Price Is Softer

Boston, May 15.—Sales of bars during the past week in New England held up fairly well compared with the average for the last three weeks, but the majority of the business was placed at new low prices. One lot of 800 tons was placed at 2.40c Pittsburgh base, and this is thought to represent the present market. Some sales of special bars were placed on a 2.50c base price, however.

Market Spread Is Narrower

Pittsburgh, May 15.—Additional sales of merchant steel bars have been made by Pennsylvania bar mills at 2.40c to 2.50c, base Pittsburgh. Since the last named figure appears to be the maximum now obtainable except on warehouse stocks, the market spread is narrower than it was a few weeks ago. Mahoning valley producers are taking up third quarter contracts with their customers, some of which indicate that their consumption during that period will approximate the extent of their second quarter orders, while others express a desire to increase the tonnage coming to them. In no case is the tonnage being cut down and lots wanted involve from 100 to 2000 tons or so per month. Some makers only now are getting into their stride in making equipment of second quarter tonnages; consequently, consumers have been somewhat slow to respend to their overtures concerning third quarter allotments. They state they are more interested in delivery of second quarter steel which they want badly. Representative cold-drawn steel finishers for instance, complain they are not getting enough hot bars. Refined iron bars continue to show improvement and consumption is slightly larger than four or six weeks ago. The price range is unchanged at 3.15c to 4.85c, base Pittsburgh, depending upon the degree of refinement. Low phosphorus melting bars show less fluctuation than other iron bars and remain unchanged at the level that has obtained for several months, around $81 per ton.

Accepting More New Business

Cleveland, May 15.—More new bar business is being accepted by the mills as was the case two weeks ago although as yet there is no general active selling movement. This renewed selling is due to the fact that some of the accumulated tonnage on order now is being eaten into by shipments and makers are more disposed to negotiate on new business. Fresh bookings, however, are not heavy. Deliveries have not shown any apparent improvement and are represented at four to six months with the larger mills. Quotations continue firm at 2.40c, Pittsburgh.

Third Quarter Buying Starts

Pittsburgh, May 15.—Healthy conditions prevail in the cold-drawn steel bar industry, and buying for third quarter is under way. While some second quarter deliveries still can be had, these apply only to certain sizes and grades. Practically all second quarter output is spoken for. New buying which lately has been on a 3.25c basis, has been interrupted of late but this is taken to be merely the natural reaction following recent heavy purchases. Orders recently written involve from 50 to 500 tons at a time with an occasional tonnage of larger dimensions than that maximum. While the automotive industry seems to have good sized stocks of cold-drawn steel in hand and apparently is anxious to consume them before re-ordering, other consuming lines are active and each furnishes its quota of the going business. Deliveries from the hot bar mills are slow but gradually are improving, and but for labor shortages here and there the cold-drawn steel bar industry would be upon a 100 per cent basis. As it is, the average continues to hover around 85 per cent.

Shading of Bolt and Nut Prices Is Reported

NUT AND BOLT PRICES, PAGE 1490

Chicago, May 15.—So much bolt and nut tonnage was carried over from first quarter into second quarter that many important users of this material contracted for somewhat less quantities during the second period. Specifications against these contracts are being filed in excellent volume and there is also considerable current buying for nearby delivery. Prices are holding firmly at the discounts adopted several weeks ago.

Order Volume Improving

Pittsburgh, May 15.—While two or three weeks ago some letup in demand for nuts and bolts was experienced, makers now report orders have been improving for the past week or 10 days and they now are operating on an 80 to 90 per cent basis. The quoted prices are firm and while numerous less-than-carload lots are being taken, a fair number of the larger orders have been booked running from a carload up to several hundred tons at a time. Several single carload orders of rivets are noted and while prices on this product are not so strong as makers would like, those quoting 3.25c and 3.35c, base Pittsburgh, respectively, on structural and boiler rivets, report that these levels recently have been obtaining on the business they have been booking in the face of competition from makers in this territory and larger producers in the East.

Orders In Slightly Less Volume

Cleveland, May 15.—Demand for bolts and nuts continues heavy but has tapered off somewhat. New business is being received in fair volume and specifications against contracts are heavy. The labor shortage is becoming more troublesome, according to some makers. Prices are firm at the quoted discounts and no shading is reported. Rivet demand is similar to that of bolts and nuts and the quoted prices are being obtained without difficulty.

Prices Being Shaded

Philadelphia, May 15.—Nut and bolt prices are being shaded here. While 40 and 10 per cent off is the quoted discount and is regarded as the market price, the most attractive business is going at around 50 and 10 off for large machine bolts. Nut prices are being shaded to some extent on attractive lots. Current demand is only of fair size and there are but few large lots being placed.

Place Orders for Third Quarter Hoops

HOOP PRICES, PAGE 1424

Pittsburgh, May 15.—Most of the third quarter output of the hoop and band mills already is obligated and producers are not yet ready to accept fourth quarter rollings. Some of the hot strip steel mills have not opened their books for the third quarter although some tonnage will be carried over for delivery in that period. The majority of the bookings has been taken on a 3.30c basis although some mills still quote up to 3.50c and on the narrow sizes and thin gages 3.75c to 4.00c still is the prevailing spread.

To Build Equipment for Southern Memorial

Announcement has just been made that the Brown Hoisting Machinery Co., Cleveland, has been selected to build the machinery which will be used in carving out the great Civil War memorial on the granite side of Stone mountain, about 10-miles from Atlanta, Ga. This memorial will consist of 150-foot figures of Gen. Robert E. Lee, his staff and army on horseback carved on the face on the mountain. Gutzon Borglum, New York, is the sculpter and has charge of the undertaking, while Lester P. Barlow, Cleveland, has been named mechanical engineer of the project.

Work already has been started on the memorial. Images of the figures

to be carved out are thrown on the side of the mountain by means of high powered lights which leave an impression on the rock previously coated with a sensitive chemical. Removal of the rock will be done by pneumatic quarrying tools. The machinery to be constructed will cost between $200,000 and $500,000 and will consits of electric traveling cranes and several pantographs or walking beams which will carry as many as 15 workmen each together with the necessary cutting tools. For protection of the workmen the equipment will have a high factor of safety.

Buys Garnet Mine

Primarily to supply polishing dust for his recently acquired glass properties, but also for the manufacture of sand paper, Henry Ford has purchased a garnet property near Danbury, N. H. Announcement of the purchase is made by W. B. Mayo, chief engineer of the Ford Motor Co. Nathan C. Harrison of Boston, for many years connected with the manufacture of abrasives and sand paper was instrumental in putting through the deal. Other interesting developments are suggested by this purchase. The Wausau Abrasives Co. with a mill in Wausau has a branch plant about a mile from the property bought by Mr. Ford. This company for several years has been mining garnet and and grinding it up for use in making sand paper, and cloth and emery wheels. This company's New Hampshire mill is at present in operation and is a modern well developed property.

Cinder and Scale Higher

Philadelphia, May 15.—Considerable business in mill cinder and scale has been done in the past two weeks, for the remainder of the second quarter and second half by mills which early in the year refused to contract for the entire year believing they would get higher prices later. While higher prices have ben done, they are as high as sellers had expected. Cinder brought $3.50 and $4 delivered eastern Pennsylvania furnace, or 25 cents to 50 cents higher than on Jan. 1. Scale brought $5.50 to $6.50 delivered eastern Pennsylvania furnace and $6.50 to $7 delivered central Pennsylvania, or 50 cents higher than at the first of the year.

To Make Castings

The Lincoln Foundry Co. has been organized by former employes and officers of the American Brake Shoe & Foundry Co. and a foundry established at Laporte, Ind., for the production of gray iron and semisteel castings. A. R. Manderson is president, George H. Rolinson, vice president, Thos. F. Lewis, treasurer and A. F. Golick, chemist and metallurgist. The foundry taken over by this company has a capacity of 30 to 50 tons per day.

The Central Boiler and Sheet Iron Works, Indianapolis, has filed a preliminary certificate of dissolution.

Car Plates Lead in Sales

Eastern Producers Unable To Satisfy Demands—Pittsburgh Makers Quoting on Mill Basis—Easier Tendency Noted

PLATE PRICES, PAGE 1424

Chicago, May 15.—With buying of railroad cars reduced to a minimum and consisting of small orders, demand on plate mills for further accommodation has diminished. This does not affect pressure for delivery of plates for use on cars contracted for in past weeks. Slackening of demand for plates for oil storage tanks also has relieved the situation of the mills. Producers are booked far ahead and are devoting their attention particularly to deliveries. The leading producer quotes 2.60c, Chicago mill, while the leading independent is not in the market at present.

Export Demand Is Better

New York, May 15.—The largest export plate order placed here in some time was entered during the past week. It involves 8000 tons for a pipe line in western Australia. Generally the export demand for plates is better. Included is one lot of 600 tons.

The largest demand for plates is for car repairs. Makers are unable to supply all that is wanted. Smaller mills are booking good tonnages for prompt shipment to car plants. Although the large makers are receiving more demand than they can satisfy, the tonnage which has been going to the eastern mills for prompt shipment is somewhat smaller. Therefore, the premiums which were being obtained for prompt and nearby plates are not as high as recently and the market on such material now may be quoted at 2.60c to 2.65c, base Pittsburgh. On contracts the plate market continues 2.50c, base Pittsburgh.

Quoting f.o.b. Mill

Pittsburgh, May 15.—Mill prices, instead of Pittsburgh base prices, apply in connection with many of the sales of plates recently recorded, where it is to the advantage of the producer to quote in that way. Prices above 2.65c disappeared a few weeks ago except as regards warehouse levels, and now 2.65c apparently has disappeared, leaving the maximum at 2.60c. The quotable spread is somewhat narrower, 2.50c to 2.60c, base Pittsburgh, or f.o.b. mill. Some orders recently have been taken by Youngstown district plate makers at 2.60c, f.o.b. Youngstown, as a maximum in lots of 300 to 4000 tons. One order of the latter size was taken from an eastern fabricator a few days ago. It is understood that the Pressed Steel Car Co still has the major portion of its large inquiry to place. Other steel car interests, tank and barge builders all want deliveries of tonnage they have on order for the second quarter and now they are being approached with reference to third quarter contracts. For that period the present market prices apparently apply. One nearby fabricator recently received an order for a gas holder to be erected at Buffalo taking 3000 or 4000 tons of plates. A few inquiries are pending for oil stills, including one from the Transcontinental Oil Co. for nine stills for erection at Fort Worth, Tex. No recent awards of oil storage tanks are noted in this territory although a few inquiries for single tanks and one or two for small groups of tanks are current.

Miscellaneous Demand Light

Philadelphia, May 15.—While heavy plate orders for car repairs have featured the eastern market lately, miscellaneous plate demand is small and eastern mills are catching up on obligations. Prices are somewhat easier. The current market is 2.50c to 2.65c, Pittsburgh, 2.50c applying on contracts with leading makers while 2.60c to 2.65c are noted for prompt and early shipment. The Pennsylvania railroad opened bids today on two, four, 8 or 12 car floats. Large oil tankers requiring 4800 tons now are up for bids.

Eastern car builders are inquiring for 1000 tons of plates, shapes and bars for repairing Virginian railroad cars.

Premium Sales Are Fewer

Cleveland, May 15.—Less willingness of buyers to pay the top prices for any considerable tonnage of plates is shown although small lots where especially needed continue to be placed at these figures. The market generally is quieter although some good tonnage remains in prospect. Some figuring on new work in shipbuilding by lake yards, the market on which has been inactive for some weeks, has been revived. A heavy equipment manufacturer in this territory placed 800 to 1000 tons of plates and shapes. Some of this material is for October delivery. One of the larger producers in the week quoted 2.60c, mill, for delivery in six to eight weeks. Quotations for early delivery by eastern mills continue from 2.80c to 2.90c, mill. The minimum of the market remains 2.50c, Pittsburgh.

Made Hoover's Assistant

Washington, May 15.—J. Walter Drake has been appointed assistant secretary of commerce by Secretary Hoover, succeeding C. H. Huston, resigned. Mr Drake has been president and chairman of the board of directors of the Hupp Motor Car Co., Detroit.

Employment Gains in April

Washington, May 15.—Indicative of the sound industrial condition of the country is the fact that a large percentage of the public employment offices report it soon will be impossible to meet the growing demand for labor, according to the United States employment service. The department of labor's April survey showed 12 of 14 basic industries reported increased employment, the great gain being in the automobile industry. Thirty-eight of 65 industrial cities reported gains in employment during the month.

Concrete Inquiry Slackens

Falling Off in Demand Follows Heavy Lettings of Previous Week—2400 Tons for Sewer Section, Detroit, Features New Inquiry

REINFORCING BAR PRICES, PAGE 1424

Cleveland, May 15.—Little activity was displayed during the past week in the demand for reinforcing bars. No large inquiries were brought out although a few of the 10 to 25 ton projects were up for figures. Awards were confined to small tonnages. The seasonal lull now in evidence is expected to terminate soon, although inquiries for large tonnages are not expected to be brought into the market again for some time. There is no tendency to shade prices in this district. Mills are quoting 2.40c to 2.50c, Pittsburgh, and 2.90c, still is being quoted for goods out of stock.

Lettings Are Few

Pittsburgh, May 15.—Occasionally a construction job in which reinforcing concrete bars are involved stands out from the usual run of business because of the large tonnage involved. A case in point is the Harrisburg, Pa., filtration plant on which bids close today. This involves 875 tons and the Oliver high school, Pittsburgh, which likewise closes today, will require 200 tons. A smaller tonnage is involved in each of the several school jobs now up for attention. It is reported that new bids are to be advertised for in connection with the Bellevue, Pa., bridge on which two local contracting companies were low bidders, one of which submitted an alternate proposition. About 400 tons are involved. Fabricators of concrete bars usually have 90 days work ahead; hence, they are making no effort to revise their quotations, which for prompt deliveries still run as high as 2.90c, base Pittsburgh. Prices of the mills are represented by a narrower spread than in several weeks past, namely 2.40c to 2.50c, base Pittsburgh.

Concrete Work Continues Heavy

Chicago, May 15.—Notwithstanding the steady volume of reinforcing bar sales through the winter and spring, new business in this line continues to present itself and sales are relatively heavy. One feature of the present market is the demand for bars for highway reinforcement, extensive programs being worked out in many western states. In Chicago a number of club, apartment and hotel structures are being figured, each involving a fairly large tonnage of bars. Most difficulty now is being experienced in obtaining bars from mills, but up to this time dealers have been able to ship with sufficient promptness to avoid delaying construction. With mill deliveries falling back trouble is expected within the next few weeks. The market is strong at 3.15c, Chicago warehouse, and this price is not being shaded by anyone.

CONCRETE CONTRACTS PLACED

Awards this week	4,050 tons
Awards last week	7,900 tons
Awards two weeks ago	2,750 tons

600 tons, Book hotel, Detroit, to Concrete Steel Co.
400 tons, building for Louisville Gas & Electric Co., Louisville, Ky., to Concrete Steel Co.
400 tons, Illinois state highway work to Kalman Steel Co.
350 tons, Missouri state highway work to Kalman Steel Co.
350 tons, Illinois Central track elevation at Champaign, Ill., to Corrugated Bar Co.
300 tons, cement plant at Rapid City, S. D., to Concrete Steel Co.
300 tons, Vanderbilt hotel, Asheville, N. C., to Concrete Steel Co.
250 tons, service station for Oakland Motor Co., Chicago, to Kalman Steel Co.
250 tons, sewage system, Paducah, Ky., to Kalman Steel Co.
200 tons, Illinois state highway work to Concrete Steel Co.
200 tons, Wisconsin highway work to Concrete Steel Co.
150 tons, Union stockyards, St. Paul, Minn., to Kalman Steel Co.
100 tons, Independent Casting Co., Chicago, to Barton Spiderweb System.
100 tons, building for Rath Packing Co., Waterloo, Iowa, to Concrete Steel Co.
100 tons, Masonic temple, Madison, Wis., to Kalman Steel Co.

CONCRETE CONTRACTS PENDING

2400 tons, third section of Conners Creek sewer, Detroit; pending.
1300 tons, New Olympic hotel, Seattle; pending.
875 tons, filtration plant, Harrisburg, Pa.; bids closed May 15.
400 tons, Lenox club, Argyle and Winthrop streets, Chicago; bids asked.
400 tons, Covenant club house, Chicago; bids asked.
385 tons, Bellevue, Pa., bridge; reported new bids are to be taken.
350 tons, Racquet club house, Schiller and Dearborn streets, Chicago; bids asked.
300 tons, apartments for Edgar Martin at Delaware and Dewitt place Chicago; bids asked.
300 tons, Sherwin hotel, Sherwin avenue and Lake Michigan, Chicago; bids asked.
200 tons, Oliver high school, Pittsburgh; bids closed May 15.

Building Programs

Creating Heavy Tubular Goods Demand—Buyers Seeking Tonnages

PIPE PRICES, PAGE 1424 AND 1490

Pittsburgh, May 15.—Visible support is given to the tubular goods market by the continued large building construction programs in various sections of the country, together with intermittent line pipe business from the oil fields. This latter, together with casing, surface and feed line tonnage, is diversified and represents a large aggregate of steel. Occasionally a 4000 or 5000-ton lot is closed such as the recent order taken by the Youngstown Sheet & Tube Co. consisting of 4, 6 and 8-inch line pipe for installation in Nebraska, about 70 miles in all. An inquiry for approximately 40 miles of 8-inch was put out recently by the Kelly & Jones Co., Pittsburgh. Usual pipe orders, however, involve from one to 30 carloads at a time and all pipe mills are turning down business, any curtailment of buying being traced to their desire not to have business on their books for delivery some months hence. Buyers are trying to increase tonnages coming to them but the extent of the mills' acceptance is governed by the tonnage already on books. Where a buyer has several hundred tons due, the only new orders the mills will accept cover sizes on which protection has not been given. The new cards of April 19 are holding firm and operations are on an average 90 per cent basis with full order books for three months or more, so that pipe makers generally see no room for pessimism.

Little Municipal Inquiry

New York, May 15.—With eastern cast iron pipe manufacturers sold up to September, trading is less active than in several weeks. Little municipal inquiry is pending, and private demand is restricted principally to small lots. The market, however, continues strong.

Makers Slow To Bid

Chicago, May 15.—To avoid booking further tonnage of cast iron pipe except for regular customers whom it is desired to favor, many makers of this product are refraining from bidding even at a high mark. The market is irregular and ranges from $50 to $53, Birmingham, as the various circumstances dictate. The National Cast Iron Pipe Co. has been awarded 150 tons for a contractor's job at Coulter, Ia. Considerable business in carloads to regular customers is being handled at present. Bids will be opened May 18 at Mt. Greenwood, Ill. on 700 tons. Figures were taken May 14 on 150 tons at Michigan City, Ind. and 115 tons at Cascade, Ia.

Working To Capacity

Birmingham, Ala., May 14.—All cast iron pipe plants in the Southern territory are working to capacity. A few lettings were made during the past week with Northwest and Middle West concerns. Several specifications are still under consideration.

Wire Orders

Are Declined by Producers as Higher Costs Loom

WIRE PRICES, PAGE 1424

Pittsburgh, May 15.—While new buying of wire products is curtailed in some directions, this mainly is from makers. They see increased labor costs and higher costs of production otherwise ahead and do not wish to meet that condition with unduly burdened order books. Hence, they are curtailing commitments wherever they can. Some are turning down proffered business every day or so because they have 60 to 90-day order books and any little progress that has been made in lowering the unfilled tonnage on their books or in discharging their obligations is welcomed. This keen demand for wire products promises to continue well into the third quarter since buying from sections not now being reached will develop by that time. Prices are unchanged on the basis of 2.75c for plain wire and 3.00c for wire nails although at least one maker is on a 3.00c and 3.10c basis, respectively.

Buying Less, Market Strong

Chicago, May 15.—Actual inquiry for wire and nails has declined somewhat from the activity of recent weeks but there remains sufficient to make a market and the tonnage asked is more than mills can book. Inability to get more than 70 per cent production, on account of labor scarcity, continues

to keep back deliveries and practically all customers have considerable material still on order. Mill books are filled for practically three months, which is further than usual and new buying is being limited to actual needs as determined by the tonnage the buyer already has covered. Prices are unchanged but less tendency is noted for premiums and the entire market is nearer a stable basis.

Tin Plate Buyers

Are Unable To Book Their Requirements—Orders Declined

TIN PLATE PRICES, PAGE 1424

Pittsburgh, May 15.—Complaints are more numerous from tin plate customers that they are unable to book all their requirements. This is particularly true of some of the buyers of tin plate for containers, since they are finding out they have deferred action too long and now discover third quarter outputs largely obligated. This condition is encountered by the American Sheet & Tin Plate Co. as well as independent producers, the leading interest being committed to its regular customers to the extent of its entire third quarter production, so that it is turning down tin plate business every day.

Some fairly large tonnages involving up to 200,000 base boxes have been turned down by it and they have been distributed among various independent producers, some being placed locally and the remainder going to such producers as the Wheeling Steel Corp., the Bethlehem Steel Corp., and others. This case oil business is for export, mainly to South America, Mexico, and the Orient, with some going to India and other points where heavy Dutch Shell Oil Co. competition is encountered. Oil companies earlier in the year bought much tin plate abroad but for this next quarter find conditions less favorable both as to price and deliveries among foreign tin plate producers, and hence desire to buy American-made tin plate.

Absolutely no signs of a letup in domestic tin plate consumption are apparent and it is because so much is being utilized for food containers that so little room is left for the foreign oil business. The price range remains unchanged, $5.50 to $6 per base box, 100 pounds, Pittsburgh, with some independents following the Steel corporation's lead by quoting $5.50 to regular customers for the third quarter. Others are naming the $6 figure.

Farrell Sponsors Drive

James A. Farrell, president of the United States Steel Corp., in helping to open a drive for a $5,000,000 fund to erect new buildings and increase facilities at Georgetown university, Washington, contributed $25,000 to the fund. Mr. Farrell's gift was announced at a dinner held in New York, May 13 and was introduced as "the patron saint of the school of foreign service at Georgetown." This school, which trains men for foreign trade in the consular service was established less than five years ago. It now has 470 students.

Sheet Backlogs Growing

Third Quarter Output of Pittsburgh Mills Fast Becoming Obligated—Demand on Valley Makers Less Urgent

SHEET PRICES, PAGE 1424

Pittsburgh, May 15.—Backlogs of tonnage running well into four figures daily are being piled up by some of the sheet mills in this district, and third quarter output fast is becoming obligated. Customers, except in one or two instances, are satisfied with the the higher levels inaugurated for that period and in some districts, east and west, allotments come short of satisfying consumers' or jobbers' wants by as much as 100 per cent, without much buying apparent of a strictly speculative character. Sheet mill operations were increased a trifle by the larger makers in this territory last week but the American Sheet & Tin Plate Co. and other makers still are hampered by a labor shortage. Notwithstanding strenuous advertising campaigns for skilled and unskilled men, no real relief is expected for about 30 days when numerous high school and college men enter the mills. Independent producers likewise are experiencing similar difficulties in obtaining and retaining full complements of men. Whereas on the basis of orders received many could operate 115 per cent due to car facilities and improved steel supplies, they only are operating on an average of 85 to 90 per cent.

A few of the independent producers still are able to promise four to six weeks' delivery on black sheets, six to eight weeks on galvanized, but are unable to accept blue annealed tonnage for shipment before July. All now are understood to be active in the acceptance of various kinds of sheet tonnage for third quarter delivery, and while the demand is exceedingly diversified, galvanized sheets continue to hold the lead in popular favor with blue annealed in close second. Recent bookings of automobile sheets leave no room for the great amount of stress being laid upon curtailed production programs.

The usual independent figure on full-finished is 5.70c, base Pittsburgh, although considerably higher is asked on certain quantities depending upon the deliveries wanted. The American Sheet & Tin Plate Co.'s quotations which are followed by two or three independent producers, are as follows: 3.00c, 3.85c, 5.00c and 5.35c, base Pittsburgh, on blue annealed, black, galvanized and full-finished, respectively. One or two of the independents naming the 3.00c base on blue annealed, quote a 3.25c base for 14 and 16-gage material; others name the 3.25c base on al gages, $5 per ton in advance of the American company's level. Prices on black quoted by independents run as high as 4.15c, $6 per ton above the Steel corporation basis, while a spread of $10 exists between its galvanized price and the maximum level asked by independents. Customers of the sheet producers, whether jobbers or users, report little or no cessation in consuming rates. Roofing sheets, however, are somewhat dull at present and one manufacturer of galvanized domestic articles reports a falling off in demand from his jobbing trade.

Buyers More Conservative

Youngstown, O., May 15.—While jobbers and manufacturers still are asking for sheet tonnage the market lacks the pressure with which it was surrounded at the beginning of this quarter. Prices of various grades of sheets are more stabilized at present than at any time this year, but despite this fact consumers are becoming more conservative in their purchases. This is reflected in the meager returns from various lists of accumulated stocks which are mailed out frequently. How long the market will continue at its present equilibrium it a matter of conjecture. Close followers of the sheet market are convinced that prices have reached their top on the present move but that little rebound can be expected in view of lower output during summer months and the probability of higher wage scales. Meanwhile, third quarter business can be placed with the majority of mills at 3.85c for black, 3.00c for annealed and 5.00c, base Pittsburgh, for galvanized. Mills with comfortable bookings are quoting black at 4.00c and blue annealed at 3.25c to 3.50c, Pittsburgh. Only two producers in this district are engaged in galvanizing and for this grade 5.00c, Pittsburgh, is being quoted.

Demand Exceeds Supply

Chicago, May 15.—An idea of the heavy requirements of steel sheet users is found in the efforts now being made to obtain larger tonnages from Inland Steel Co. than can be alloted for third quarter in its present division of the tonnage it expects to roll during that period. In almost every case the consumer is seeking to obtain a larger allotment than has been given and were the requirements all to be covered by contracts, the mill would be oversold for months. This excess demand cannot be cared for by western producers and must seek an outlet with mills further east. Considerable inquiry is coming from Texas and Louisiana and from users who formerly have not obtained their supply from Chicago producers. This business is offered in lots of 100 to 500 tons. Sheet production is reduced from that obtained during the winter, owing to shortage of labor, sheet mill workers preferring to put in only part time.

Eastern Market Easier

Philadelphia, May 15.—Sheet demand continues fair. Premiums prices on black and galvanized are less in evidence. It is possible to place black sheets for early delivery at 3.85c, Pittsburgh, galvanized at 5.00c and blue annealed at 3.00c to 3.25c. Some third quarter contracts for blue annealed have been placed at 3.25c, as well as at 3.00c. Certain makers are quoting blue annealed at 3.00c, base, for 12-gage and heavier, and 3.25c for lighter gages.

Shape Lull Reappears

Wages in Building Trades Dominate New York Structural Market—Mills Not Anxious for Further Commitments

STRUCTURAL SHAPE PRICES, PAGE 1424

New York, May 15.—Dominating the local structural market is the question of wages in the building trades. Until present negotiations between contractors and representatives of the building trades are concluded, postponement of considerable work is probable. During the past week, several large projects scheduled to go ahead immediately have been held up.

Possibly the most important issue at stake in present negotiations, is that of long-time contracts. Some trade representatives are demanding contracts of two years duration at even higher than present schedules. Contractors, generally, are opposed to such agreements and are countering in some instances with proposals of bonuses, but as yet no settlements have been made.

Little doubt prevails but what present wages will be maintained at present levels at least for many weeks to come. Notwithstanding the postponement of considerable work, a heavy volume of building is still pressing.

While this situation is exerting an important influence in the present less active structural market, it is also to be remembered that there is normally a slowing up in activity at this time, following as it does, just after the spring buying season. Another factor is the scarcity of steel and the accompanying advance in deliveries. Virtually all fabricators in this district are unable to do better than three to four and one-half months delivery. This in turn is making for a strong erected market. Lofts are quoted at around $105 to $110 erected with office buildings $115 to $120, and apartments $120 to $130. Shapes continue steady at 2.50c to 2.60c, base Pittsburgh, with delivery premiums slipping somewhat.

Confidence is reflected in the recent action of the Iron League, whose members do virtually 90 per cent of the erection work in the metropolitan district, in recommending an increase of about 10 per cent, effective after May 20. Erectors now are getting $1.12½ an hour, and the recommendation calls for $1.25.

Steel awarded during the first quarter of this year in the metropolitan district, exclusive of piers, subway work, bridges, etc., amounted to 143,931 tons, according to L. F. Caproni, of the Hay Foundry & Iron Works. Preliminary figures announced a few weeks ago were 126,000 tons. The normal requirements of the district are estimated to be 360,000 tons annually.

The McClintic-Marshall Co., noted last week as low bidder on about 6200 tons of steel for the Flushing subway extension, submitted a figure of $679,823. Before an award is made, the approval of the board of estimate must be given. When the commission first received bids for this work Dec. 14, 1922, the Phoenix Bridge Co. was low with a bid of $615,880. In this case, the board of estimate failed to act.

A feature of the new inquiry being brought out is that of Metropolitan banks, six such institutions entering the market in the past week for small jobs requiring from 100 to 300 tons apiece. The general contract for the New York telephone building, requiring from 10,000 to 12,000 tons of structural shapes, has been awarded to Marc Eidlitz & Son, Inc. The steel work for the foundation is expected to be erected in June.

Inquiry Falls Off

Chicago, May 15.—An actual falling off of inquiry for structural projects has appeared and at present comparatively few important structures are being figured. This change has been expected for some time, in view of the heavy and continuous buying which has prevailed over many months. The situation is not unwelcome but it is believed the demand will return before long.

Recent lettings in the West are confined to railroad and industrial projects and involve only moderate tonnages. Plain material continues unchanged at 2.60c, Chicago mill, the quotation of the leading purchaser. Inland Steel Co. has not yet divided its third quarter tonnage nor announced its prices for that delivery.

New England Market Inactive

Boston, May 15.—Fabricators are for the most part well booked with contracts for several months ahead and are not seriously concerned with the decline in new work. Small jobs continue to be let in fairly encouraging volume, but the jobs involving larger tonnages are now being held up. One market authority feels that this is because of a belief that prices are soon to decline. Movement of structural shapes from warehouses to supply small spot demand is unusually heavy. The price for mill shipment is from 2.50c to 2.55c, Pittsburgh. The price for plates is higher and sales at 2.60c, base, are reported.

Good Order Books Rule

Pittsburgh, May 15.—Good order books are the rule among the mills rolling structural shapes as well as among the shops doing the fabricating. The latter are not able to operate on quite so high an average as the mills themselves, perhaps 80 per cent being a fair average as against 90 to 95 per cent, the mill average, but they have enough business on their books to keep them busy on that basis for at least two months to come. At present, they are more concerned about discharging some of their old obligations than they are about increasing commitments and welcome a breathing spell in order receipts so that they can concentrate on the catching-up process. Prices from the mills are more restricted than they have been, 2.50c to 2.60c Pittsburgh, representing the present quotable market. Awards are few and far between and are confined to small tonnages, 50 to 250 tons at a time, although this week action is expected to be taken on the New Castle, Pa., bridge requiring 1400 tons.

Conditions Grow Less Excited

Philadelphia, May 15.—While considerable structural shape business has been placed in this district recently for car repairs, the demand is generally smaller than in the past month, so that conditions are much less excited. Large makers continue to quote 2.50c, base Pittsburgh, and considerable tonnage was booked at this basis in the last couple of weeks. In fact, the supply at this figure seems somewhat easier. Eastern makers continue to book scattered lots at 2.85c, base mill. Considerable structural business is on the books but no new lettings of importance are being made. Indications are that high costs of construction are discouraging building here.

Lettings Continue Light

Cleveland, May 15.—The lull in the structural shape market, in evidence some weeks ago was quite pronounced during the past week. Lettings were few and were confined mostly to orders not exceeding 40 tons. Inquiry has fallen off with few jobs coming up for figures. Interest in this district centers about the inquiry for 4000 tons for the Cleveland public library, bids for which will close on May 28. Action in regard to the 8500 tons required for the Statler hotel, Detroit, will be postponed until building material and labor costs show an appreciable reduction. The proposed Statler hotel in Boston is being postponed for the same reason. On standard shapes 2.50c to 2.60c, base Pittsburgh, is the general price. Eastern mills are now offering standard shapes at 2.80c, base mill, for quick delivery.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 8,027 tons
Building awards last week..... 13,927 tons
Building awards two weeks ago.... 27,940 tons

1600 tons, school No. 70, New York, to Harris Structural Steel Co.

1075 tons, filter and dryer building at Jones island sewage disposal plant, city of Milwaukee, to Milwaukee Bridge Co.

1015 tons, ship buildings, mill "B", Crown Willamette Paper Co., Portland, Oreg., to Poole & McGonigle.

1000 tons, bridge work for Norfolk & Western railroad, to Mt. Vernon Bridge Co.

600 tons, building for State Mutual Assurance Co., Worcester, Mass., to New England Structural Co.

500 tons, six highway spans, Sturdivant, Ala., to Virginia Bridge & Iron Co.

400 tons, erection shop, for McIntyre & Seymour Corp., Auburn, N. Y., to Bethlehem Steel Bridge Corp.

375 tons, building addition for the Title Guaranty & Trust Co., Maiden Lane, New York, to independent fabricator.

300 tons, Lynn high school, Lynn, Mass., to independent fabricator.

300 tons, Church of the St. Angelina, Bronx, to A. E. Norton, Inc.

250 tons, club building for University of Michigan, at Ann Arbor, Mich., to American Bridge Co.

250 tons, telephone building, Trenton, N. J., to independent fabricator.

250 tons, sub-station for the New York Edison Co., 120th street, New York, to Harris Structural Steel Co.

210 tons, two 98-foot plate girder spans for Great Northern railway, to American Bridge Co., announced last week as awarded to unknown fabricator.

112 tons, bridge work for Illinois Central railroad and Chicago, Burlington & Quincy railroad, to American Bridge Co.

STRUCTURAL CONTRACTS PENDING

2500 tons, hotel and doctors' building, Fifty-

second street and West End avenue, New York; bids asked shortly.
16,000 tons, Statler hotels, Detroit and Boston, action on awards postponed pending lower construction costs.
10,000 to 12,000 tons, building for American Telephone & Telegraph Co., New York; general contract awarded to Marc Eidlitz & Son, Inc.
1000 tons, loft building at 51 West Fifty-sixth street, New York; pending.
660 tons, public school No. 99, New York; pending.
650 tons, loft building for Magoba Construction Co., Twenty-ninth street, New York; pending.
580 tons, Keith Theater building, Akron, O.; bids in May 17.
500 tons, widening Folsom street bridge, Milwaukee; new bids to be asked on revised plans.
350 tons, loft building for Magoba Construction Co., Twenty-sixth street, New York; pending.
300 tons, building for Chase National Bank, 61 Broadway, New York; pending.
300 tons, school building, Cleveland; bids being taken.
300 tons, plant for Atwater-Kent Co., Philadelphia; pending.
300 tons, Weirton, W. Va., high school; bids taken until June 1.
250 tons, building for Commonwealth Bank, Seventh avenue, New York; pending.
250 tons, Home Savings bank, Toledo, O.; Henry J. Spieker Co., general contractor.
200 tons, hydroelectric plant at Flat Rock for Ford Motor Co.; Stone & Webster to issue specifications shortly.
200 tons, building for Mechanics & Metals Bank, New York; bids asked.
150 tons, school building at Nemacolin, Pa.; bids close June 2.
150 tons, Ward building No. 12, Allegheny county hospital for the insane at Woodville, Pa.; bids close May 23.
100 tons, Peoples' Trust Co., Brooklyn, pending.
100 tons, Bank of Manhattan, New York; pending.
100 tons, Staten Island Savings Bank, Staten Island, N. Y.; pending.

To Hold Safety Show

A Safety, Health and Sanitation exhibition will be held by the city of Brooklyn, N. Y. at the 106 Infantry armory, Oct. 20-27. The exhibition is being held for the purpose of attempting a reduction in preventable deaths, accidents, property destruction and disease through the application of various modern protective devices and methods. Companies specializing in such lines are eligible for space on the exhibition floor. Information may be obtained from the Safety, Health and Sanitation exhibition, 371 Fulton street, Brooklyn.

Caucasian Ore Sold

New York, May 15.—Approximately 200 tons of Causacian washed manganese ore have been sold out of a shipment now afloat at 48 cents per unit, c.i.f. tidewater. This is the highest figure done on manganese ore in the present movement. Otherwise the market has been featureless during the past week. Good sized inquiry for manganiferous ore is pending but no further business in this grade has been transacted during the past week.

Blow In More Furnaces

Philadelphia, May 15.—The Dunbar furnace of the American Manganese Mfg. Co. was blown in on foundry iron May 14, but will be switched to spiegeleisen in three or four weeks. The Lochiel furnace will be blown in on foundry and basic this week or next. The Eastern Steel Co. has blown in its second Warwick furnace making two now active.

Big Rail Tonnage Booked

About 310,000 Tons Placed By Leading Systems With Western Mills—Car Buying Continues Light

RAILROAD TRACK MATERIAL PRICES, PAGE 1424

New York, May 15.—Imperial Railways of Japan and the South Manchurian railways together have placed orders for rails aggregating 16,000 tons in this country. Special orders also have come from Argentina for rails, cars and locomotives.

The New York Central railroad has not yet taken action on its inquiry for 175,000 tons of rails for the last half of 1923. It is expected that this tonnage will be placed at the old price of $43, base mill, for standard open-hearth rails. The Pennsylvania railroad still has negotiations under way for 100,000 tons of rails for last half. The steel companies are not anxious to book any more rail tonnage at this time than necessary.

While car buying is light, demand for locomotives continues good, the largest order reported recently involving 50 for the Missouri Pacific which were placed with the American Locomotive Co. The Lehigh Valley has closed on 10 to the American Locomotive Co. Other awards include five switch engines for the Utah Copper Co., two for the Ferrocarrilles De Norte De Cuba and two for the Louisiana & Arkansas, all going to the Baldwin Locomotive Works. The Chino Copper Co. has closed on four switch engines and the Seaboard Air line on two locomotives, both contracts going to the American Locomotive Co. The Minneapolis Northfield & Southern, awarded contracts for two locomotives to the H. K. Porter Co., and the Niagara Junction railroad, two electric locomotives to the Westinghouse Electric & Mfg. Co.

Roads Need Much Steel

Chicago, May 15.—Heavy buying of steel, not only in rails and track fastenings, but in plates, shapes and bars as well, is expected to continue steadily for some time. Experienced railroad officials believe that their roads are about four years behind in equipment to make them efficient and able to handle the transportation demands of the country. This makes it necessary for them to buy for several years to come considerably more than normally required each year. Earnings are now much larger than has been the case for some time and buying can be financed and the roads put on a better basis. As a result of the effort to rehabilitate transportation lines, inquiry for rails and track fastenings continues in spite of the large tonnages already awaiting delivery. Leading systems have closed with western mills for about 310,000 tons of rails for last half delivery. The Southern railroad recently covered for 30,000 tons of rails, most of which went to the Tennessee company.

Due to the tremendous demand for steel for miscellaneous consuming sources, the mills are not anxious to take any more rail business at this time than is necessary at the price being done on second half. Rails now are being booked at the old figure of $43, base mill. Although the producers believe this price is low, they do not think an advance under present conditions would be warranted.

Good demand for moderate lots of track fastenings continues. The largest sale of tie plates recently was 1000 tons.

Signs of Improvement Appear

Pittsburgh, May 15.—Signs of improvement are beginning to be manifest in the light rail market. Coal mines, anticipating heavier operating schedules with the opening of the lake coal season, are looking to their light rail supplies and orders this week are larger than in several weeks past. Orders taken were all at 2.25c, base Pittsburgh.

Briskness again marks the track accessory market. While individual lots of spikes, tie plates or track bolts are not large, small less-than-carload or carload lots for filling in purposes are so numerous as to make up attractive aggregates. Third quarter requirement inquiries of the railroads are not coming out in large measure as yet although these are expected shortly. Prices are unchanged on the following bases: 3.15c for standard railroad spikes, 3.75c for small railroad spikes; one producer quotes 3.50c on boat and barge spikes, while at least one large producer is quoting 3.75c; tie plates are quoted at $52 per ton as a minimum while track bolts are quoted from 4.25c, base Pittsburgh, up.

Car Inquiry Still Light

Philadelphia, May 15.—Awarding of 2000 car repairs by the Seaboard Air Line was the only large order of the south placed with car builders from this district. Of the total award, 1100 steel underframe box cars went to the Richmond Car Works, 500 wooden cars to three plants and 400 steel cars to Virginia Bridge & Iron Co. The Hocking Valley railroad last week deferred for the second time the placing of 2000 40-ton plain automobile box cars.

CAR ORDERS PLACED

Canadian National railway, 30 sleeping cars, to Canadian Car & Foundry Co.
Seaboard Air line, 2000 cars, as follows: 400 steel cars to Virginia Bridge & Iron Co., 1100 steel underframe box cars to Richmond Car Works, 500 wooden cars, divided among three unnamed plants.
Atlantic Coast line, 50 ballast cars, to American Car & Foundry Co.
Bessemer & Lake Erie railroad, 500 box cars, to Greenville Steel Car Co.

CAR ORDERS PENDING

Norfolk & Southern railroad, 100 hoppers and 100 gondolas; bids asked.
Virginian railroad, 100 to 150 car repairs; to be placed this week.
Hocking Valley railroad, 2000 40-ton plain and automobile box cars; award deferred for second time.
Live Poultry Transportation Co., 200 poultry cars; bids asked. This is in addition to 100 recently awarded to New City Car Co.
Phelps Dodge Corp., 66 hoppers; bids asked.
Chicago, Burlington & Quincy railroad, 200 coal cars, 600 gondola repairs; pending.
Public Service Gas Co., 200 hoppers; pending.
White Coal Mining Co., 50 mine car bodies; pending.
Gulf Smokeless Coal Co., 75 mine cars; pending.
Red Jacket Consolidated Coal & Coke Co., 100 mine cars; bids asked.

The Nonferrous Metals

Metals Continue Their Slump at Rapid Pace with Several Factors Contributing—Lead Is Firmest in List

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	Lead† New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
May 9.....	16.50	16.62½	43.50	7.35	6.85	26.50	7.62½	29.00
May 10.....	16.50	16.62½	44.25	7.25	6.75	25.50	7.62½	29.00
May 11.....	16.40	16.50	44.50	7.15	6.70	25.50	7.50	29.00
May 14.....	16.37½	16.50	42.00	7.25	6.60	25.50	7.50	29.00
May 15.....	16.00	15.75	42.00	7.25	6.60	25.50	7.37½	29.00

†Outside market quotation.

NEW YORK, May 15.— Metals have continued their declines here and in London at a rapid pace. And buying has been as light as prices have been weak. Large buying early in the year with most users still covered several weeks ahead, lack of exports, and uncertainty in regard to the volume of business in the summer, are factors making the depression.

Copper has been so lacking in interest on the part of consumers that large producers have practically quit naming prices and only a few small tonnages in the outside market are bringing the market down. Some copper was sold last week around 16.50c, delivered, by the large interests, but little has been done since then and the outside market has fallen well below 16c, refinery, without attracting buyers, though a good tonnage is available at the lower levels.

Brass mills are taking on a little new business and wire mills have been doing some new selling, but on the whole the products are quieter than they were, though not so quiet as copper and zinc. Prices of products have shown little change, as mills still are fairly well booked.

Zinc showed a little sign of life about a week ago, but since then has been on the down grade more rapidly than ever. The reason appears to be that most smelters are not well booked beyond the early part of June. On the other hand stocks, as shown in the new monthly statistics, were cut to less than 9000 tons at the beginning of this month, or less than a week's shipments. In April the shipments, practically all domestic, were 47,911 tons, or slightly more than 1000 tons larger than output, while the latter fell 10 tons a day, despite a larger number of retorts operating. Brass mills appear to be well covered on zinc but it is thought galvanizers will have to enter the market on a fairly good scale before another month and the strength of the market will depend largely upon how far ahead they cover. Zinc sheets have been cut from 9.65c to 9.20c.

Tin has been following London in an idle market; but shipments into consumption have continued large. It is thought the market will fluctuate one way and another, probably mostly downward, until the tin plate mills cover on requirements for the summer and then the market will depend much upon how rapidly surplus stocks at the Straits are offered. The fall in the past few weeks has been 7 cents.

Lead, after falling about 1 cent in a month, is the one metal to show a little firmness, but buying is not yet large. Influence of the London market has been weakening, but in the past few days the London market turned stronger. Substantial buying is expected before the end of the month.

Aluminum has been easing, though it is in better demand but not really heavy demand. Shipments of the producer are understood to have improved and its prices are unchanged. Imported metal still is not available for new offers.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled, 24 oz., min.	25.50
High brass	21.75
Zinc, ga. 9 to 18 (plates ½c less)	9.65
Lead, full sheets (cut ¼c more)	11.25
Aluminum, base 18 ga. and up...	35.40
SEAMLESS TUBES	
High brass	26.50
Copper	28.00
RODS	
High brass, round, ⅝ to 2½ inch	20.00
Naval brass rod	22.25
WIRE	
Copper	19.50
High brass	22.25

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	10.00 to 10.50
New York	10.50 to 11.00
Chicago	11.25
HEAVY YELLOW BRASS	
New York	7.50 to 7.75
Chicago	8.25
Cleveland	7.50 to 8.00
ZINC	
New York	4.25 to 4.50
Cleveland	3.75 to 4.00
HEAVY COPPER AND WIRE	
Cleveland	12.50 to 13.00
New York	12.75 to 13.00
Chicago	13.00
RED BRASS TURNINGS	
New York	9.50 to 9.75
Cleveland	9.50 to 10.00
Chicago	10.50
YELLOW BRASS TUBING	
Cleveland	7.50 to 8.00
NO. 1 BRASS ROD TURNINGS	
Cleveland	7.00 to 7.50
New York	7.75 to 8.00
Chicago	8.50
ALUMINUM BORINGS	
Cleveland	12.00 to 13.00

The Timken Bearing Co., Canton, O., reports net earnings for the March quarter of $2,069,269, after allowance for taxes. This represents an increase of 53 per cent over earnings for the corresponding period of last year.

Railroad Records Continue To Be Bettered

Washington, May 15.—Although carrying a record amount of freight for this season of the year the railroads continue unable to earn the 6 per cent granted them by the interstate commerce commission. Preliminary figures for March place the rate of return at 5.84 per cent, compared with 3.73 for February and 5.96 for March, 1922. This latter figure is the highest reached by the railroads since the commission theoretically fixed rates high enough to net 6 per cent.

Although the average hourly wage rate of all railroad employes is 136 per cent above the 1914 level and the cost of living is only 62 per cent higher, demands for increased wages are becoming more frequent. Shopmen are agitating for an increase of 20 cents an hour, to 90 cents, especially on the New York Central and its subsidiaries. The Pennsylvania railroad has increased the wages at its shop at Altoona 3 cents per hour. Officials in Washington do not discern a strike in the offing but they regard this wage unrest as likely to put another barrier between the public and lower rates.

Freight business of the railroads continues to break all seasonal records, loading in the week ended April 28 having been 963,694 carloads, which was 6000 over the preceding week and 212,000 over the corresponding week of last year. Ore loading was up to 24,135 cars—a record for April. Because of new equipment and more expeditious handling ,the car shortage is dwindling, the daily average shortage in the period April 23-30 having been 35,282 and the surplus 13,556.

On May 1 the railroads had 50,259 locomotives serviceable—a new high record. On the same date the number of bad-order locomotives was only 14,131—a new low record. Freight cars in need of repair on May 1 numbered 210,505, or 9.2 per cent of the number on line. This was a decrease of 3546 from April 15. In April the railroads put into service 10,979 new freight cars, making a total of 50,151 installed since Jan. 1. Cars on order May 1 were 115,756. In April 293 new locomotives were installed, bringing the total for the year to April 30 up to 1228. The number on order on May 1 was 1956.

Erect New Mill Building

Philadlephia, May 15.—Erection of a new building to house the existing 100 12-inch plate mill of the Pottstown Iron Co., Pottstown, Pa., has been begun by McClintic-Marshall Co. The Pottstown Iron Co. is being operated under lease by the Glasgow Iron Co. The building is expected to be completed in June. There are no changes being made in the mill itself.

Coast Strikes Continue

Unions in Metal Trades Council Ask for Wage Increase—Pig Iron Market Quiet with Prices Firm—Fabricators Busy

SEATTLE, May 12.—Labor difficulties are hampering general business to some extent in the Pacific Northwest and have affected the iron and steel trade. However, the trouble is not widespread and there is every indication that it will not be of long duration.

Following the settlement of the strike of Washington union miners, I. W. W. workers in the logging camps of this state and Oregon walked out. This week they returned to work although threats of further trouble are heard. This week members of all unions affiliated with the Seattle Metal Trades council walked out to enforce a demand for a wage increase of 10 cents an hour for workers of all crafts. The crafts affected are machinists, pipefitters, boilermakers, and blacksmiths. Estimates vary as to the number of men who have quit, although the plant of Todd Dry Docks, Inc. is the largest involved. Officials of the United Metal Trades association state that practically none of their men walked out, the workers being generally satisfied with wages and conditions. The molders are not affected as they are not affiliated with the Metal Trades council and any action taken by this craft will be independent.

The union demand is for an increase of 10 cents an hour in a scale which is uniformly 72 cents an hour for mechanics and 52 cents for helpers. The great majority of metalworking plants in this district are operating on the American plan. Union officials claim that some employers have signed the new scale but no large shops have done so.

While interruption of the lumber output and general business has affected the turnover of iron and steel, the trade reports a fine volume notwithstanding. No particularly large tonnages are pending but the total of many small orders is making a record for aggregate volume.

Pig Iron and Coke

There is little change in the situation. The demand has slowed down to some extent, foundries and shops not buying as actively as 30 days ago. However, prices remain firm on about the same levels as 2 weeks ago. Only British and Scotch iron is being brought into this market as other foreign and domestic grades cannot compete under present conditions.

There is a fair demand for coke with no change in the last fortnight. Fernie is supplying most of the deman in this state and Oregon. California consumers have been asking quotations on Fernie but it was found that the rail freight from Fernie to San Francisco shut out the British Columbia grade in competition with cheap coke from Utah.

Bars, Plates and Shapes

There are no outstanding features in this market although these items continue in good demand. Prices are firm. Dealers are closely watching the water freight situation. If the intercoastal conference is reorganized an advance over the present rate of 30 cents is likely and jobbers will place their orders accordingly. There is still complaint regarding uncertainty of delivery. The local steel mill is operating steadily with considerable work on the books, including several orders for export.

Other Finished Materials

Jobbers report business active, April showed the largest totals of any month this year. Despite labor troubles May is registering a heavy volume of turnover, everything in stock being in good demand. This is particularly true of rivets, bolts, pipe, bands, building hardware and also sheets which are coming into better positions. Prices are unchanged from last week. The interruption in the logging and lumbering industry has been felt by jobbers but not severely and with the resumption of activity in those industries it is expected that the demand will remain steady and up to present proportions.

Fabricating houses are fairly busy as contracts for a number of steel bridges in Washington and Oregon are being completed by plants here and in Portland.

Voters of Seattle this week authorized a bond issue for the construction of the Montlake bridge, a steel structure estimated to cost more than $500,000. This improvement will be undertaken as soon as possible.

Old Materials

Activity is somewhat less pronounced inthis branch than two weeks ago. Foundries and machine shops have felt the effects of interruption in logging and lumbering and this condition has been passed on to the scrap market. However, the situation as a whole is firm, No. 1 cast iron scrap being quoted at $28 up and steel scrap at $14 up. The local steel mill is using large quantities of scrap, most of it coming from railroad sources. Japanese buyers are buying whenever they can find a bargain in steel scrap but trans-Pacific freights are against them. Scrap dealers still report difficulty in replenishing their stocks.

Load More Steel on Tows

Pittsburgh, May 15.—Work of loading the tow of the steamer WARREN ELSEY of the Vesta Coal Co., subsidiary of the Jones & Laughlin Steel Corp., will begin shortly. The tow will consist of seven 200-foot barges, two new steel barges 132 feet long, and two fuel flats with a total of 8500 tons of steel. The steamer ALIQUIPPA on her last trip to St. Louis had the longest tow pushed up the Mississippi river since the days of the steamers J. B. FINLEY, JOE WALTON and others. The ALIQUIPPA had an all steel tow of three barges, 400 feet long, with 2500 tons of steel.

Pittsburgh Traffic Larger

Pittsburgh, May 15.—Shipment of iron and steel products from Pittsburgh over the waterway system of the Ohio, Monongahela and Alleghaney rivers continue to increase in bulk. The total transported in this manner in April was 42,725 tons according to figures issued by the federal engineers in this city. This total is the largest since December, the shipments of that month reaching 44,300 tons. The following table shows the monthly comparison since the resumption of shipments of steel products in May 1922:

	Allegheny river	Monongahela river	Ohio river	Total
April	100	21,825	20,800	42,725
March	....	17,291	16,191	33,482
February	....	19,337	3,285	22,622
January, 1923.	....	26,997	1,030	28,027
December	1,100	24,350	18,850	44,300
November	4,420	28,475	22,851	55,746
October	4,420	19,380	24,726	48,526
September	....	21,970	6,538	28,508
August	....	23,545	16,977	40,522
July	....	25,633	9,880	35,513
June	....	33,675	16,600	50,275
May, 1922	....	28,112	16,765	44,877

Slight Gain in Workers

Washington, May 15.—Preliminary figures of the bureau of labor statistics indicate an increase of 0.5 per cent in employment in April over March, an increase of 1.4 in total wages paid and an increase of 0.9 per cent in average weekly earnings. Forty-three industries were surveyed, 19 revealing increased employment and 29 increased payroll totals. The iron and steel industry reported a slight gain in the number of employes but a recession of 2.6 per cent in total earnings, according to the bureau. A total of 4382 manufacturing establishments reported to the bureau for April; 85 per cent were on a full-time operating basis, and 13 on part-time.

Society Holds Outing

Members and guests of the Cleveland Engineering society participated in the organization's first outing of the year on Tuesday, May 15. Luncheon first was served at the society's rooms at the Winton hotel after which the party motored to the plants of the Electric Vacuum Cleaner Co., the Colburn division of the Consolidated Machine Tool Corp. and the Reliance Electric & Engineering Co. The party then went to Euclid Beach park where a dinner was served which was followed by a smoker and entertainment.

Steel Problems

Are Discussed by Purchasing Agents at Eighth Annual Convention

Cleveland, May 15.—The iron and steel groups provided the outstanding discussions at the opening sessions of the eigth annual convention of the National Association of Purchasing Agents here this week.

When President T. Addison Clohosey of Westinghouse Lamp Co., Cleveland, called the opening covention session to order, Tuesday morning, approximately 1000 members of the organization were present.

The delegates separted into groups at noon when special luncheons were provided for those interested in nonferrous metals, lumber, paper, iron and steel. In the steel session, O. W. Morton, American Hoist & Derrick Co., St. Paul, Minn., was chairman. The subjects discussed in this group were, "Specifications on Steel for Various Purposes," and "Future Market and Deliveries." The main interest of this group was centered, however, in the discussion which followed the address by J. F. Froggett, editor of *Daily Metal Trade*. Mr. Froggett's talk dealt mainly with present conditions of prosperity and activity and with the outlook of business for the remainder of this year and the first half of 1924. He expressed himself optimistically over the solution despite the recent growth of unfavorable sentiment.

In the iron group meeting, G. W. Sanborn, United Engineering & Foundry Co., Pittsburgh, was chairman. Although several subjects were discussed the main emphasis was placed on the standard pig iron contract. This was discussed under the subjects "Commercial Arbitration Clause in N. A. P. A. Pig Iron Contract" and "Contingencies Clause in Pig Iron Contract." The other subjects discussed by the members of this group were the standardized contract form for the purchase of malleable iron castings, report of special committee on standard pattern practice, and the invitation from American Engineering Standards committee to co-operate with them in formulating standard specifications for galvanizing or sherardizing on iron and steel. The nonferrous group, of which E. W. Knight, Frankel Bros., Toronto, Ont., was chairman, discussed details covering the operations of the controlling forces governing the production and marketing of tin and "Grading of Scrap and its Relation to Ingot Metals."

The formal address of the morning session was delivered by Harvey Firestone, Firestone Tire & Rubber Co., Akron, O. His speech concerned the problems facing American users and producers of rubber, and presented cogent reasons why America should produce its own rubber. At the Canadian session, with R. F. Simpson presiding, Lieut. Col. Charles R. McCullough, Hamilton, Ont., spoke on the industrial and commercial progress being made by Canada, and expressed the firm conviction that present close business and political relations between the Dominion and the United States would continue to be beneficial to both countries.

The "informashow," containing the exhibits of 109 companies opened Monday morning in public hall. Many classes of commodities are being exhibited in the booths on display.

Buys Coking Plant

Uniontown, Pa., May 15.—At a cost of approximately $500,000, the Puritan Coke Co. has purchased 260 acres of coal land in German township, and the entire plant and equipment of the Hoover coking plant. The purchase recalls a deal 10 years ago, in which the same property was to have been sold for less than one-tenth of the amount now paid by the Puritan company, which is backed by James R. Cray. W. W. Marshall, and G. S. Harah, but the deal was never completed.

The purchase of the Hoover interests gives the Puritan Coke Co. control of six coking plants, with 550 ovens, having a capacity of 12,000 tons of coke and 1000 tons of by-products per day.

Magnesite Output Larger

Washingotn, May 15.—Crude magnesite production in the United States in 1922 increased 32 per cent over that of 1921. A total output of 63,487 short tons were produced in 1922, according to figures compiled by the United States geological survey. Practically all of the magnesite mined in 1922 was obtained from deposits in California. No crude or calcined magnesite was exported in 1922, and 112,159 tons were imported in 1922 up to Sept. 22, the date of the going into effect of the new tariff act. More than 90 per cent of the domestic magnesite produced in 1922 was sold in the calcined form and brought from $30 to $50 a ton.

The Michigan Steel Corp., Ecorse, Mich., is offering for sale an issue of $500,000 first mortgage 15-year 6½ per cent sinking fund gold bonds.

Millions To Be Refunded Under Tax Ruling

Washington, May 15.—Many millions of dollars will be refunded by the treasurer, according to Commissioner Blair of the bureau of internal revenue, because of a ruling governing claims filed under an amendment to regulations dealing with distributions out of earnings or profits by holding corporations accumulated before March 1, 1913. Heretofore earnings turned into a holding company have lost their identity and have been subject to taxation when distributed by the parent company. This is now reversed by the following amendment to the regulations:

"Whenever one corporation has received from another corporation distributions out of earnings or profits accumulated by such other corporation prior to March 1, 1913, or out of increase in value of its property accrued prior to March 1, 1913, and the receiving corporation, after having first distributed all of its earnings and profits accumulated since Feb. 28, 1913, distributes to its stockholders the amount so received by it from such other corporation, such distributions are not dividends within the meaning of the revenue act and are exempt from tax."

Elect New President

Stockholders of the Crocker-Wheeler Co., at their annual meeting, recently, elected directors for the ensuing year and the directors immediately elected officers as follows: President, Edmund Long; vice presidents, Arthur L. Doremus and Clarence N. Wheeler; secretary, Herbert C. Petty; treasurer, Theodore S. Fuller; assistant treasurer, George W. Bower. In his election to the presidency, Mr. Long succeeds Dr. Schuyler Skaats Wheeler, founder and president of the company since its organization 40 years ago. Directors elected were: Edward W. Brown, Arthur L. Doremus, Hampton D. Ewing, Earnest B. Humpstone, Frank H. Jones, Edmund Long, Professor Michael I. Pupin and Clarence N. Wheeler.

Plan Huge Ore Movement

Duluth, May 15.—The Oliver Iron Mining Co. will ship nearly 30,000,000 tons of ore this season, according to officials of the company. Independent operators also are figuring on shipping an equal tonnage. All companies are hiring addiitonal miners. Labor is freer since wages have been raised. Mining operations in the Virginia, Eveleth and Hibbing districts are more active than in several years. The movement of ore steamers is considerably hampered by ice in lower Lake Superior.

European Markets Are Quieter

Prices Further Reduced in Effort To Obtain New Business—Japan Buys Ship Steel from London Merchants at $43.96 f. o. b., Replacing Undelivered Ruhr Tonnage—Germans Again Ordering British Coal

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, May 14.—European market conditions in general are quieter, as international traders are awaiting further clarification of the continental situation. Belgians are the most aggressive competitors of those on the Continent, offering billets at £7 5s ($33.55), and shapes at £8 5s ($38.17) f.o.b. British mills are subsiding largely on accumulated specifications and have cut prices of plates and shapes to obtain new business. Demand for pig iron has receded slightly and there is little selling for export.

Japan has purchased several thousand tons of bulb angles and other ship steel for repair jobs from London merchants at £9 10s ($43.96) f.o.b., replacing orders for tonnages produced in the Ruhr which the Germans have been unable to deliver.

The export market for coke is inactive, but the Germans again are buying coal.

The French correspondent of IRON TRADE REVIEW reports from Paris, that pig iron production is increasing and that prices are weaker, foundry iron having sold for 454 francs ($30.15) delivered. Belgian prices are stronger following the receipt of good export orders. The German correspondent of IRON TRADE REVIEW reports from Dusseldorf that the German situation is more confused than ever, and negotiations for the release of tonnages accumulated in the Ruhr district have not produced results as yet. Consumers in unoccupied districts of Germany are not buying foreign iron or steel at present.

Price changes in the British market during the week bring the following products to the levels as noted: English and Scotch plates for home and export £9 ($41.65); English and Scotch beams £9 10s ($43.96); galvanized sheets £19 5s ($89.08); tin plate £1 4s 6d ($5.67); rails for export £9 15s ($45.12); West Coast hematite £6 2s 6d ($28.34) and No. 3 Staffordshire iron £5 7s 6d ($24.87).

Sterling exchange is figured on a basis of $4.62¼.

Quiet Conditions Prevail in British Market

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

Sterling—$4.64

BIRMINGHAM, Eng., May 4.—Buyers still are keeping out of the market and the effort to force down prices has been partially successful. English billets can be bought at £8 15s ($40.60) delivered here, a reduction of about £1 ($4.64) per ton below the quotation three weeks ago. Belgian competition is keener, although restricted almost entirely to semifinished steel, 2-inch billets being sold yesterday at 8£ 5s ($38.28) delivered, with £7 17s 6d ($36.54) on bloom sizes. The Belgians promise delivery in three weeks. It is believed the minimum has not yet been reached in continental prices. A further reduction has been made in No. 3 Belgian iron, now obtainable at £9 15s, ($45.24) delivered, this iron is being used chiefly for nut and bolt making, South Staffordshire being the best customer.

Cleveland pig iron has been reduced 2 shillings 6 pence ($0.58) making the standard for No. 3 G. M. B. £6 5s ($29.00). A similar reduction has taken place in Scotch pig iron, and East Coast hematite has become £6 2s 6d ($28.42) per ton. The comparative firmness of pig iron is clearly attributable to the small output and the impossibility of getting an adequate number of furnaces into operation with the present scarcity and high price of coke.

In the Cleveland district blast furnace coke costs £2 4s ($10.20) per ton delivered as compared with £1 8s 3d ($6.55) a year ago when the selling price of pig iron was £4 10s ($20.88). The smelters anticipate that the next ascertainment of selling prices will give the men an advance in wages, and in regard to coke the rise in miners wages seems to preclude the possibility of easier prices. Certain Midland smelters are being quoted higher prices for coke for contracts renewable in June. In the Midlands prices of pig iron have not been reduced.

Firm prices are maintained in the Barrow district although there is hardly any booking of orders. An additional furnace has been started there making the total number 18, and another is being made ready in the Cumberland area. Two additional furnaces have been started by W. Whitwell & Co., Ltd., at Thornby to make hematite iron, making the number operating on the northeast coast 47. Quite a large proportion of the blast furnaces at work have no iron to offer for the general market, their output being absorbed by steelworks.

In the finished steel trade the most sinister development is the lockout of boilermakers in connection with the shipyards. This has already reduced the demands upon the steelworks and is holding up a lot of business. A great deal of repair work has been sent abroad. The only reductions in finished steel are in small bars and other products produced from billets, concessions being obtainable in view of the lower price of semifinished material. Small bars for which £12 10s ($58.00) was recently charged can now be bought at £11 10s ($53.36). Steelworks have good order books. The Ebbw Vale works this week started its siemens—martin and bessemer plants and Steel, Peach & Tower, of Sheffield, have lighted another 60-ton furnace at Templebrough, making nine out of the 14 new furnaces in operation, the firm now turning out from this new department 5000 tons of steel per week. The output of basic and acid steel in the Sheffield and Rotherham areas is greatly in excess of the pre-war average.

The placing of large orders by the railways seems to indicate a certain amount of confidence in the market. The London & North Eastern Railway Co. has given to its own factories orders for 78 locomotives, 280 passenger coaches and 10,635 goods wagons in addition to 36,130 goods wagons placed with local builders. It is well known that local wagon builders have

Current Iron and Steel Prices of Europe

Last Reported Prices Converted into Dollars at Rates of Exchange, May 14

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	38.18	8 5 0
Sheet bars	38.18	8 5 0
Wire rods	57.76	12 10 0
FINISHED STEEL		
Steel bars, England, ½ to 3-inch	49.75	10 15 0
Steel bars, England, ½ to 3-inch, for export	46.28	10 0 0
Plates, ship, bridge and tank, England	41.65	9 0 0
Plates, ship, bridge and tank, Scotland	41.65	9 0 0
Beams, England	43.96	9 10 0
Beams, Scotland	43.96	9 10 0
Sheets, black, 24-gage	62.47	13 10 0
Sheets, galvanized, 24 gage	89.08	19 5 0
Rails, 60 pounds and over	47.43	10 5 0
Rails, 60 pounds and over for export	45.12	9 15 0
Tin plate, base box, 108 pounds	5.67	1 4 6
Steel hoops	57.76	12 10 0
Steel hoops, for export	55.53	12 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	28.34	6 2 6
Hematite, West Coast, Mixed Numbers	28.34	6 2 6
Basic Middlesbrough	28.34	6 2 6
No. 3 foundry, Middlesbrough	28.92	6 5 0
No. 3 foundry, Derby, Leicester, Nottingham	25.45	5 10 0
No. 3 foundry, Northamptonshire	24.87	5 7 6
No. 3 foundry, Staffordshire	24.87	5 7 6
No. 3 foundry, Scotch	27.19	5 17 6
Ferromanganese, 76 to 80 per cent	83.30	18 0 0
Ferromanganese, 76 to 80 per cent, for export	92.55	20 0 0
COKE		
Yorkshire furnace	6.94	1 10 0
Yorkshire furnace, for export	15.04	3 5 0
Yorkshire foundry	8.10	1 15 0
Yorkshire foundry, for export	15.04	3 5 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	15.60	678,300
Foundry, No. 3, Oberhausen	14.84	645,300
Bessemer Stahleisen, Siegen	16.93	736,300
Foundry, No. 1, Oberhausen	14.91	648,300
Luxemburg foundry	14.61	635,300
COKE		
Ruhr furnace	2.43	105,740
Ruhr foundry	2.71	108,950
SEMIFINISHED STEEL		
Billets	16.74	728,000
Sheet bars	20.47	890,000
Wire rods	19.87	864,000
FINISHED STEEL		
Standard rails	21.16	920,000
Merchant bars	23.28	1,012,000
Structural shapes	23.07	1,003,000
Ship plates	26.24	1,141,000
Medium plates, 3 to 5 millimeters	29.49	1,282,000
Sheets, below 3 millimeters	33.83	1,471,000
Tin plate	24.84	1,080,000
Plain wire	28.11	1,222,000
Bands and strips	37.48	1,586,000

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	35.19	530
Basic bessemer, Lorraine	23.87	480
Foundry, Longwy, No. 3, sand-cast	31.21	470
Foundry, Longwy, No. 3, chill-cast	23.87	480
Ferromanganese, 76 to 80 per cent	102.92	1,550
COKE		
French furnace	8.96	135
German furnace, f.o.b. frontier*	13.15	198
German furnace, f.o.b. frontier**	20.58	310
French foundry	9.63	145
SEMIFINISHED STEEL		
Blooms	42.16	635
Billets	44.16	665
Sheet bars	46.48	700
FINISHED STEEL		
Standard rails	36.52	550
Merchant bars	49.14	740
Angles	46.48	700
Normal beams and profiles	46.48	700
Plates, ship and tank, 10 millimeters and thicker	53.78	810
Plates, bridge and tank, 5 to 10 millimeters	55.78	840
Sheets, black, 3 millimeters	58.43	880
Sheets, blue annealed, 2 millimeters	68.39	1,030
Shafting, cold-drawn, 40 to 60 millimeters	92.96	1,400
Bars, 2 per cent nickel steel	146.08	2,200

All prices are f.o.b. furnace or works.
*Up to 38 per cent of normal requirements.
**Over 38 per cent of normal requirements.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	23.78	415
Basic open-hearth, Belgian	31.23	545
Gray forge, Belgian	15.47	270
Foundry, No. 3, Belgian	29.51	515
Foundry, No. 3, Luxemburg	28.08	490
Foundry, No. 3, Lorraine	28.08	490
SEMIFINISHED STEEL		
Blooms	31.52	550
Billets	35.81	625
Sheet bars	37.82	660
Wire rods	49.56	865
FINISHED MATERIAL		
Standard rails	41.54	725
Merchant bars	40.11	700
Normal beams and profiles	38.39	670
Plates, 5 millimeters and thicker	41.83	730
Sheets, black, 3 millimeters	45.84	800
Sheets, galvanized, 1 millimeter	106.00	1,850
Plain wire	73.06	1,275
Galvanized wire	83.09	1,450
Wire nails	74.49	1,300

All prices are f.o.b. furnace or works.

order books insuring activity for the next 12 months. Some rail works are quite well off, but the Workington mills are idle and still awaiting orders. It does not appear that foreign competition is effective in the finished department, certain prices approximating English quotations. An Antwerp figure for joists this week is £8 15s ($40.60), equal to £10 ($46.40) delivered, a figure very close to the British quotation.

English steelmakers are not unmindful of the growth in imports from the continent. We received from Belgium during March 5,000 tons of billets and 3000 tons from Germany, 10,000 tons of bar, rod round and angle iron from Belgium, 12,000 tons of sheet and tin plate bars from Belgium and 1000 tons from Germany. In finished material there were consignments of 3000 tons of joists and 5000 tons of steel plates and sheets. The total of iron and steel imports was double the quantity imported a year ago, and it seems likely that the figures will increase.

The alertness of the foreign steelmaker is quite sufficient to prevent runaway prices in this country and practically compels the British steelmakers to keep their quotations to the conditions prevailing in the international market.

Galvanized sheets and tin plate to some extent share the quieter conditions, but the only effect so far has been to check the upward tendency. In Scotland the makers of black sheets have sufficient work to keep them active during the summer, and in South Wales the makers of galvanized sheets are able to maintain their prices at £19 10s ($90.48) to £20 ($92.80). One of the largest firms in the Midlands has put on two additional mills to make black sheets for galvanizing. The makers of tin plate are not booking so briskly as they were, but they have orders to carry them well through the summer and some new business has come from France, Italy and South America. There is no difficulty in maintaining the £1 4s 6d ($5.68) basis but the makers are doing their best to raise the standard to £1 5s ($5.80).

The recent returns of exports showed a satisfactory bulk of business. Galvanized sheets were exported during the first three months of the year to the amount of 154,741 tons as compared with 143,300 tons during the corresponding period of last year. Tin plate was sold abroad to the amount of 136,517 tons as compared with 107,924 tons in 1922.

Steel scrap has undergone a decided slump. At the quarterly meeting three weeks ago £5 ($23.20) was considered a moderate price for scrap and urgent buyers paid up to £5 10s ($25.52). The same material has been sold this week at £4 5s ($19.72). Rather large quan-

tities are coming into the country, especially to South Wales, several cargoes having been discharged this week at Swansea and Llanelly. This material last year was obtainable at £2 10s ($11.60) per ton and one large user in South Staffordshire bought 15,000 tons at the price. Due to the influx of material, consumers are in no hurry to buy.

French Plan To Increase Iron Output

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de Bienfaisance

Franc $0.065

PARIS, May 3.—The attention of French blast furnace operators is turned toward the Ruhr. It is estimated that stocks of coke accumulated at the coke ovens there now aggregate 700,000 to 800,000 tons. The work of removing the stocks is progressing favorably. Lorraine furnaces are receiving an average of 5000 tons of Ruhr coke daily. French steelmakers see danger ahead, however, as the Germans now are restricting coke production to the actual requirements of Ruhr furnaces. This action was taken when it became apparent that the French intend to carry out their program of requisitioning all coke supplies available in the Ruhr. Unless the French take measures immediately to compel the Germans to continue operation of their ovens to capacity, stocks will soon be exhausted and the French iron and steel industry will be in a worse position than it was last February, as stocks existing at that time have disappeared. At present, however, the coke situation is easier than for many weeks. In February the French received only 9567 tons of Ruhr coke, and 15,000 tons in March whereas over 44,000 tons crossed the frontier during the first 8 days of April.

With American, Belgian and English coke now entering France it is hoped that pig iron production can be increased. The Societe Metallurgique de Knutange will blow in another stack soon. Only two of the ten belonging to this concern are operating. Basic bessemer pig iron chill-cast No. 3 now averages 475 francs ($30.85) to 485 francs ($31.50). Hematite iron also is easier to obtain and prices are softening. English furnaces are offering mixed numbers, analyzing about as follows: Carbon 3.92 per cent; silicon 2.00 to 3.00; sulphur 0.04; phosphorus 0.05; and manganese 0.25 to 0.50, at 595 francs ($38.65) per metric ton f.o.b. wagon Le Terport, duty paid.

Steel production is slowly increasing although still far below normal. The market is extremely quiet and prices are sagging. Mills in the North are quoting beams at 720 francs ($46.80); plates 820 francs ($53.30); skelp 800 francs ($52); and bars 780 francs ($50.70), all per metric ton f.o.b. mill. These prices are considerably lower than the high peak of three weeks ago, but consumers believe that they must descend still further. The demand for plates, however, is active, large quantities being imported from Belgium.

The price of reparations coke for May has been fixed at 198 francs ($12.87) by the organization which has charge of distributing reparations and imported coke to the blast furnaces. It hopes to be abe to supply consumers with 38 per cent of their requirements at this price during May. The price for any coke required by the furnaces over and above their reparation allotment will be 310 francs ($20.15.) Great efforts are being made to increase coke production in France and progress is being made. The February output of French coke ovens amounted to 76,000 tons, and from present indications the May output will be about 125,000 tons which will be fairly satisfactory as compared with the past few months.

German Business Almost at Standstill

European Special Service

Mark—$0.000032

DUSSELDORF, Germany, May 3.—Business is almost at a complete standstill and the general feeling in the occupied territory is that events are drifting to a crisis. It is not believed here that the passive resistance program can be sustained for more than a relatively short time. The increase in the bank discount rate from 12 to 18 per cent, coupled with the recent depreciation of the mark, has served to undermine confidence in the ability of the government to maintain its policy of resistance successfully.

Iron and steel production in the Ruhr still is about 50 per cent of the output before the occupation, but conditions along the Rhine are worse than in the eastern portion. German consumers in unoccupied territory are now purchasing much less foreign fuel, pig iron and steel, although deliveries on old contracts continue to be received.

Special prices have been fixed for pig iron which is now being produced in unoccupied territory with English or American fuel. No. 3 foundry iron is held at 957,000 marks ($30.80) compared with 645,300 marks ($20.60) for pig iron made with German fuel. Very little of the latter is available. Hematite smelted with foreign coke is 990,000 marks ($31.75) per ton.

Considerable iron ore is going into stock at Rotterdam and Amsterdam at the expense of the buyers who are unable to ship it into the Ruhr on account of the French import duty of 10 per cent ad valorum, the German government also having forbidden the purchasers to submit any bills of lading or other cargo documents to the allied authorities.

The railroad traffic situation is worse than ever and it is becoming difficult to ship goods by motortruck on account of the restrictions which the occupying authorities are enforcing.

Welsh Exports Continue To Set Records

European Special Service

Sterling $4.66

CARDIFF, Wales, May 3.—Records in the exports of tin plate from South Wales are becoming monotonous, for nearly every week now sees the previous figure passed. This tends to show that the prosperity which the Welsh makers are now enjoying is not a fluctuating wave of good luck, but a genuine indication of better days for the trade.

Prices are firm and are being further strengthened by the fact that coal and steel are also on the strong side. Block tin is lower, and a few second-hand parcels of tin plate have changed hands recently at £1 4s 9d ($5.76) base I. C., f.o.b. works port. This is 3d (5½ cents) a box under previous quotations.

A fair number of inquiries continue to come in from the Continent, particularly from Spain and Italy and Scandinavia. Buying of odd sizes has been done at £1 5s ($5.81) base I. C., f.o.b., and wasters, which show an easier tendency, may be had at £1 3s 9d ($5.53) base f.o.b. for C. W. 20 x 28-inch plates firm at £1 3s ($5.41) base I. C., f.o.b. work's port. Current quotations are: Cokes, 14 x 20 inch $6.10, £1 5s to £1 5s 6d ($5.81 to $5.93); cokes, quarters, £1 5s 6d to £1 6s 3d ($5.93 to $6.10); cokes, 10 x 20, £1 15s 9d to £1 16s 6d ($8.32 to $8.49); cokes, 20 x 28, £2 10s to £2 11s ($11.65 to $11.88); ternes 20 x 28, £2 6s to £2 7s ($10.75 to $10.93).

Tinplate bars are unchanged at the official minimum of £10 ($46.60) per ton less 7s 6d ($1.73) rebate to the tin works. Galvanized sheets are quieter, but prices are firm at £19 10s to £20 ($90.87 to $93.20) for 24 gage corrugated in bundles. Overseas markets are quiet except that quantities of galvanized are being bought for the Far East. Nickel is unchanged at £130 ($605.80) for home and export consumption.

Scrap still is in demand and firm in price for most classes of material. Heavy melting steel scrap is £5 5s to £5 10s ($24.45 to $25.63) a ton; bundled steel scrap and shearings are £4 10s to £5 5s ($20.97 to $24.45); steel turnings are £4 15s ($22.12); mixed wrought iron and steel scrap is £4 10s to £4 15s ($20.97 to $22.12) for heavy, and £2 17s 6d to £3 ($13.26 to $13.98) for light material; heavy cast iron scrap is £4 15s ($20.97 to $22.12); and good machinery scrap is £4 10s ($20.97) a gross ton.

The exports of iron and steel products from South Wales ports during the week ended April 13 created a postwar record and probably a record for all time. The total shipments were 32,081 tons, and were made up as follows: Tin and terne plate 11,368 tons, black plate and sheets 533 tons, galvanized sheets 3325 tons, and other iron and steel goods 12,053 tons. The exports in the latter section of the trade were remarkable. Newport was the chief center for the shipments, its quota being 9789 tons of "other goods." Among the cargoes were 2453 tons of steel rails to Rangoon, 2193 tons to Bombay, 1000 tons of steel hoops to Alexandria, and 1752 tons of steel ties to Mombassa.

Central European Mills Still Active

European Special Service

Austrian crown—$0.000014

VIENNA—May 3.—Central European markets are still under the influence of the Ruhr situation. Although the volume of new business has diminished the mills have received sufficient specifications to keep them busy until well into the summer. Active operating conditions have brought a recrudescence of labor troubles. The coal miners employed by the Alpine Montan Gesellschaft, who have been on a strike for some weeks, have been persuaded to return to work. The coal strike in Czecho-Slovakia also has been settled.

The rail order of the Prussian state railways mentioned previously amounts to 30,000 tons. The Prussian railways also have ordered locomotives in Austria. In addition, the German railroads have placed orders with the Prager Eisengesellschaft in Czecho-Slovakia. This company will soon have four furnaces in blast.

Prices in the Czech market continue firm. Bars are quoted 1550 Czech crowns ($44.95) per metric ton; tank plates 1800 crowns ($52.20), and 1 millmeter sheets 2100 crowns ($60.90). The foregoing prices are for domestic business. The lowest price on bars for export to the Balkans is 1750 crowns ($50.75), while bars are being sold to Germany at 2000 to 2100 crowns. In view of the higher prices being obtained for export, home consumers are experiencing difficulty in getting satisfactory deliveries.

Poland expects to spend the equivalent of $903,000 this year on improving its railroad repair shops, together with $4,171,000 for cars and $3,074,000 for locomotives.

In Russia the Bolshevists announce that they will produce 270,000 tons of pig iron and 500,000 of open-hearth steel this year. At present about 20 small blast furnaces, 40 open-hearth furnaces and 90 rolling mills are in woking order in Russia. The value of the Czech crown is $0.029.

Scrap Lacks Strength

(*Continued from Page* 1426)

ume, practically all consumers being out of the market. As a result prices are weak, although no actual reductions have been made in the Cleveland market during the past week. However, declines have occurred in the valley, heavy melting steel being down $2 a ton to $22.50 to $23; machine shop turnings, $17 to $17.50; hydraulic compressed sheets, $22 to $22.50; bundled sheets, $17.50 to $18.

Prices Continue Downward

Detroit, May 15.—The local scrap market has undergone another severe decline, most of the better grades being reduced $1 a ton, while lighter grades are off 50 cents a ton. Offerings from large producers are more urgent, but consumers are entirely out of the market. Consumers report they are well protected with heavy melting steel, borings and turnings. Several of the large automobile plants have pressed sales recently, it is reported, but their accumulation resulted from indisposition to sell when prices were higher. Dealers assert fully 65 per cent of the scrap from the big automobile companies now goes direct to consumers.

Consumer Buying Limited

St. Louis, May 14.—Dullness and further declines feature the market for scrap iron and steel. Transactions are limited, and many of the quotations in dealers' lists are purely nominal. Some revisions downward took place, affecting mainly rails for rolling, wrought grades, cast scrap, malleable, stove plate and some specialties. Consumers are doing but little buying, and dealers report it is almost impossible to sell anything, even when radical concessions are offered. The cancellation record since May 1 is more formidable than has been the case in several months.

The short interest, which for a while served to place the brakes on the decline, has been eliminated, so that that prop has been taken from under the market. Prices here have been relatively lower than elsewhere, which has permitted of profitable shipment of certain grades to eastern points. The demand from the East, however, has slackened. Mills and foundries continue to operate at the recent high levels. Consumption is on a large scale, and it is only a matter of time before the industries must resume purchasing.

Railroad offerings are liberal, and general market conditions considered, the carriers have received good prices on the material disposed of. Offerings before the market include 3000 tons by the Northern Pacific, 1500 tons by Mobile & Ohio, 2000 tons by the Great Northern, 700 tons by the Texas & Pacific and a small list by the Southern railroad. The St. Louis & San Francisco sold 60 cars of yard scrap and 25 cars of scrap rail. The American Steel Foundries Co. is still buying steel specialties.

Some Consumer Buying

Birmingham, Ala., May 14.—Some iron and steel scrap is being bought and a number of consumers are asking for prompt deliveries on contracts placed some time ago. Local consumers are not holding up deliveries. Dealers are bringing in as much old material as they are selling. Heavy melting steel is not so very active though the largest consumer in this district is operating around 90 per cent of capacity.

Weakness Still Is Seen

Philadelphia, May 15.—The iron and steel scrap market in this district continues to show weakness. Heavy melting steel is selling at $20 delivered and indications are that even lower will be quoted. At least 10,000 tons of melting steel was bought during the past week by Bethlehem at $20 delivered. Another steelmaker bought 2000 tons. Aside from these orders current business is of a miscellaneous character. The tonnage moving is small in volume and there are no signs of a shortage of material.

Little Demand Is Met

Cincinnati, May 15.—Iron and steel scrap is weak and listless in the local market, with most activity in the rolling mill grades. Cast, malleable and low phosphorus are especially weak and little demand is met. Large users, especially of steel grades, continue to reject rigidly, showing they have more scrap coming in than they can accommodate and are unusually careful as to grading. Railroad offerings are fairly large. The Norfolk & Western has asked for bids on a list aggregating approximately 4000 tons. During the past week, prices declined a $1 a ton on a majority of the items. The market is now $4 under the high point of the year. The bulk of the trading is among dealers. The present slump in prices is due almost entirely to the fact the recently reported scarcity of scrap was overestimated. Reductions have failed to stimulate interest and it is next to impossible to sell anything aside from small prompt lots. The movement of scrap on contracts is particularly heavy.

8-Hour Shifts

Are Inaugurated At Several Valley Open-Hearth Plants

Youngstown, O., May 15.—Steelworks and rolling mills in the Mahoning valley continue to operate close to capacity although production is declining owing to the warm weather and labor shortage. Negro labor is being brought into this district for employment at blast furnaces and various departments but so far has not checked the decrease in output. Three district open-hearth plants are inaugurating eight-hour shifts as fast as new crews can be obtained which will do away with the 12-hour turns. The progress in this direction, however, is slow owing to the shortage of steelworkers.

Independent open hearths being charged total 49 which represents 96 per cent of capacity. These are distributed 11 each at the Brier Hill plant and the East Youngstown plant of the Youngstown Sheet & Tube Co., 14 at the Republic Iron & Steel Co., 7 at the Trumbull Steel Co. and 6 at the Sharon Steel Hoop Co.

Sheet mill operations are unchanged with 98 per cent of capacity engaged. Of the 115 units under power 42 are active at the four plants of the Youngstown Sheet & Tube Co., 17 each at the Newton Steel Co. and the Republic Iron & Steel Co., 15 at the Trumbull Steel Co., 9 at the Sharon Steel Hoop Co., 8 at the Falcon Steel Co. and 7 at the Mahoning Valley Steel Co.

Next week officials of the Trumbull Steel Co. plan to put on 6 of the 10 hot tin mills at the Liberty plant which has been idle for several weeks due to the scarcity of steel. At present this company has 19 hot tin mills and all strip departments engaged. The Republic Iron & Steel Co. is operating 7 finishing mills, 5 pipe mills and its bessemer department and the Youngstown Sheet & Tube Co. 10 pipe mills, 2 bessemer converters and its rod and wire departments. Four district plate mills are engaged.

Labor Shortage Restricts Higher Operations

Pittsburgh, May 15.—Schedules of blast furnace and steel mill operation in Pittsburgh and nearby districts would be higher but for labor shortages. In addition to advertising, mills have labor scouts out endeavoring to collect crews. Some have retained regular employment agencies for their needs exclusively while others have endeavored to co-operate with various city departments with a view to furnishing work to the idle men they find. While these haunt the employment agencies ostensibly looking for work, they apparently do not want it since after they are hired they rarely stick out the first week.

The Carnegie Steel Co. continues to operate 93 or 94 per cent of steel ingot making capacity and keeps 53 out of 59 blast furnaces active, one being down for rebuilding at Duquesne and 5 remaining out because of lack of men. Two furnaces at Columbus, O., for instance would be blown in immediately if crews were available. Independent steel mills are averaging around 91 per cent so that the average for the entire industry is 94 or 95 per cent. The Westinghouse Electric & Mfg. Co. is operating full in every department except the radio division. Production of small motors is approximately 300 per cent greater than a year ago while automotive equipment production is the same.

Hot mill men are particularly scarce, and sheet and tinplate manufacturers are hampered in their production and shipments. One or two made slight increases in sheet mill operation the past week but the general average remains at between 85 and 90 per cent. Pipe mills continue to average above 90 per cent while cold-drawn, strip and other finishing mills are operating practically full depending upon the labor supply.

Illinois Steel Stacks Are Operating at Capacity

Chicago, May 15.—With the blowing in of the fourth blast furnace stack at the Joliet plant of the Illinois Steel Co. last week all of the 27 steelworks stacks of this company now are operating. One of the merchant stacks at Bay View, Milwaukee, is idle. The condition of having all the 27 steel work stacks active at the same time is so unusual that search of the records was made to find a parallel instance where all the blast furnace capacity at Gary, Joliet and South Chicago was engaged at the same time. No such instance was found and, while it is not certain, it is believed this is the first instance. Usually one or more stacks are out of commission for relining or other repair. Several furnaces which have been operating four or five years or even longer may be put out within the next few months for relining, which will break the continuity of the present full operation.

Directors of the American Locomotive Co., have approved a plan calling for the issuance of 500,000 shares of no par value common stock, which will be exchanged for the present 250,000 shares of common $100 par value. The exchange will be made on the basis of two shares of new for one share of old stock.

Discuss Co-operation in Steel Export Trade

London, May 4.—During his stay in England on his recent trip to Europe, Judge Elbert H. Gary, chairman of the United States Steel Corp., had a meeting with a number of the leading British iron and steel producers and also with the heads of the principal British iron and steel manufacturers association, at which the question of international co-operation in export trade was discussed informally. American mills, chiefly those of the Steel corporation, have long been prominent in export rail and other trades. The great problem in any international sales syndicate is the distribution of tonnage. Heretofore the European producers have not been disposed to allot American interests a share of the business in proportion to their producing capacity. It is also understood to have been the sense of the recent gathering in London that little definite progress can be made until the Ruhr situation is settled and the relations of continental producers to each other determined.

Unfilled Bookings Drop

For the first time since December, 1922, the unfilled bookings of the United States Steel Corp. declined, the total for April, just announced, being 7,288,509 tons. This is a drop of 114,823 tons, or 1.5 per cent. Further comparisons follow:

Date	Total	Change, tonnage	Change, per cent	
Apr. 30, 1923....	7,288,509	114,823—	1.5	—
Mar. 31, 1923....	7,403,332	119,343+	1.63	+
Feb. 28, 1923....	7,283,989	373,213+	5.40	+
Jan. 31, 1923....	6,910,776	165,073+	2.31	+
Dec. 31, 1922....	6,745,703	94,539—	1.39	—
Nov. 30, 1922....	6,840,242	62,045—	.89	—
Oct. 31, 1922....	6,902,287	210,680+	3.14	+
Sept. 30, 1922....	6,691,607	741,502+	12.4	+
Aug. 31, 1922....	5,950,105	173,944+	3.01	+
July 31, 1922....	5,776,161	140,630+	2.48	+
June 30, 1922....	5,635,531	381,303+	7.2	+
May 31, 1922....	5,254,228	157,311+	3.08	+
April 30, 1922....	5,096,917	602,769+	13.4	+
Mar. 31, 1922....	4,494,148	353,079+	8.5	+
Feb. 28, 1922....	4,141,069	100,609—	2.307	—
Jan. 31, 1922....	4,241,678	26,736—	0.0062	—
Dec. 31, 1921....	4,268,414	17,872+	0.004	+
Nov. 30, 1921....	4,250,542	36,287—	0.84	—
Oct. 31, 1921....	4,286,829	273,841—	6.004	—
Sept. 30, 1921....	4,560,670	28,744+	0.63	+
Aug. 31, 1921....	4,531,926	298,398—	6.3	—
July 31, 1921....	4,830,324	287,544—	5.59	—
June 30, 1921....	5,117,868	364,619—	6.2	—
May 31, 1921....	5,482,487	362,737—	6.2	—
April 30, 1921....	5,845,224	439,541—	6.8	—
Mar. 31, 1921....	6,284,765	649,102—	10.32	—
Feb. 28, 1921....	6,933,867	639,297—	8.21	—
Jan. 31, 1921....	7,573,164	574,958—	7.59	—

The Wanner Malleable Castings Co., Hammond, Ind., which was recently formed to take over the assets of the Wanner Malleable Iron Co. of Indiana, is offering to the public a new issue of 50,000 shares of convertible common stock without nominal or par value.

IRON TRADE REVIEW

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Business Men Study Economics

BUSINESS men, especially those of the executive class, more and more are taking up the study of economic phenomena as a definite and essential part of their jobs. Wherever conventions are held today or groups of business men assemble to discuss their particular problems, much attention is being given to an examination of business fundamentals. This usually is in the form of a penetrating analysis of all or several of the factors which influence the current position and future trend of the particular line of commercial effort. The chart or graph invariably figures as an essential part of these studies because of its effectiveness in conveying to the average mind basic facts and comparisons. The machine tool builders, representing a highly specialized mechanical industry, at their convention the past week devoted much of their attention to a consideration of business tendencies and to problems of their business which the former more clearly have set before them. The conviction was prevalent among these manufacturers that the economic and commercial side of their business including a greater familiarity with conditions in related industries, must command more and more of their thought and effort in the future. This plainly felt need of better and clearer business guidance which the machine tool builders are reflecting, is typical of various other lines of collective industry.

After allowance has been made for a certain amount of fadist enthusiasm or impractical effort which the recent widespread extension of economic analysis may tend to create, the general movement signalized by the quest for more complete business data upon which to base policies and judgments, is highly important to American commerce. Only a few years ago the United States was characterized as a nation of economic illiterates. This actually is less truthful today.

This country as well as other leading commercial nations have had a rather extensive experience during the past six or eight years with the mutations of economic law on a broad scale and have paid the price that ignorance or indifference always pays. The economic education of the country or else the appreciation of its lack, therefore, has been increased. Doubtless the spirit of great caution in business that has been aroused in recent weeks has been due to the lessons of the past, sharply learned, particularly those of 1920. It is a very hopeful and promising thing, therefore, when business men more definitely realize their own deficiencies and are more inclined to value economic cause and effect. A school of really capable executives better able to plan their future operations will be the result.

Production Is Phenomenal

DURING April pig iron was being produced at a rate almost 5000 tons per day in excess of the previous highest output in the history of American manufacture. In a period of eight months, beginning with last August production has more than doubled itself by a series of consecutive gains. The output of April indicated an annual rate of nearly 43,500,000 gross tons, as against the 41,500,000-ton rate in September, 1918, when the previous record daily production was made. During the first four months of this year coke pig iron has been produced at an average daily rate of about 112,000 tons per day or on an annual basis of almost 41,000,000 tons. If this average can be maintained for the balance of the year the total output for 1923 would exceed the record production of 39,019,123 tons in 1916 by nearly 2,000,000 tons. As yet no signs of a letup in iron production are in evidence. On the contrary, a brief summary of operations at the middle of May indicates that another record may be established this month. Assuming no deterring factors during the next 15 days, production probably will total about 120,000 tons per day.

At the same time pig iron was establishing a new output record in April, steel ingot production was setting a new mark. While the total for the month was somewhat less than in March, the average daily output of April was almost 14,000 tons better than March.

The production of April indicated an annual rate of 49,110,000 tons. The output of the first four months of 1923 indicates a daily rate of 148,000 tons per day or an annual basis of 46,000,000 tons. Were this rate to be maintained throughout the balance of the year, the 1923 output would exceed the previous high output of 43 619,200 tons in 1917 by about 2,500,000 tons. These figures show unmistakably the extraordinary scale of present production. Whether consumption is keeping pace is the unanswered question.

Building Buyers' Strike Impressive

THE long predicted buyers' strike in the construction industry has been translated from a threat to an actuality. Beginning in Greater New York, where the snowballing of wages has become a favorite sport in the building trade, the resistance to soaring costs is spreading to other centers. The deepest concern of business men now involves the probable extent of the curtailment and the effect it may be expected to have upon other lines of trade.

At the present time there is no prospect of an immediate collapse of the building boom. Many new projects may be postponed, but a reasonable amount of curtailment is not only desirable but necessary. Costs of building have been rapidly getting out of line with the general level. Wages have reached fantastic heigths and brick, lumber and other materials have been advancing by leaps and bounds. Structural steel alone remains on a moderate plane. Although the average of iron and steel prices is now 80 per cent above 1913 and general building costs are 104 per cent over the prewar basis, structural steel has increased to only 67 per cent more than 1913.

When the year opened the building industry was under a tremendous momentum. The season of 1922 had shattered all previous records for construction. The program for 1923 called for even greater exertions, or the expenditure of about $6,000,000,000 in building. Competent authorities maintained that this program called for more labor and materials than were available in one year. The cloth had to be trimmed somewhere. For a time builders continued to bid furiously for materials and labor until an untenable price structure was erected. Costs have increased 37 per cent in the last year, as measured by the Aberthaw index of a new concrete factory building.

The present wave of postponements of building should have a healthy and stabilizing influence not only upon the construction industry, but upon all business as well. If the amount of building to be done immediately is kept within the limits of the country's facilities, the flight of wages and material will be checked. Moreover a huge backlog of construction will have been piled up during the year, against the time when costs are lower. The building shortage accumulated during the war and postwar lapse of new construction is still considerable, in the view of many authorities. As for the effect of the development in the industry upon the iron and steel trade, leading steel executives are inclined to take an optimistic view. The steel mills have sufficient business ahead to keep them busy until winter no matter what happens in building.

The first tangible result of the slowing down in new undertakings is seen in the April record of F. W. Dodge construction awards, pictured in the Business Trend. Although the month normally shows a gain over March of from 11 to 15 per cent in the square feet volume of new building, the increase this year was less than 1 per cent. Residential and industrial awards actually declined. Compared with last April, however, all building shows an increase of 10 per cent, residential of 26 per cent and industrial of 16 per cent. Manifestly the building boom can stand a substantial measure of deflation before it begins to suffer from anemia.

Do Side Lines Pay?

WHEN business is slack, manufacturers are faced with the difficult problem of holding their organizations intact. In some cases executives simply bow to what seems to be the inevitable, and forthwith close their plants and lay off their working forces. Others, not willing to give in so easily, strive to find ways of keeping their facilities engaged until a normal volume of business returns.

The latter course was adopted by many manufacturers in 1922; in fact there probably were more plants occupied with temporary contract work, the production of "side lines" or experiments with other expedients than at any time in recent years. A number of shipbuilders, fabricators, etc., undertook locomotive repair work as a side line. Several machine tool builders turned their facilities to the production of washing machines and vacuum cleaners. Still other manufacturers devoted their plants to carbuilding and car repair work.

Gradually, as business in practically all lines of the metal industry has improved, the executives of the companies engaged in temporary work have been forced to decide whether or not the side line is worth continuing. A few presidents can point with pride to figures showing that their ventures into emergency work actually have netted a profit. Others can show that although losses appear on the books, the companies really saved money by virtue of the fact that their organizations were held together during the slack period. In still other instances, flat failures are reported.

The subject is worthy of careful study. Fill-in or contract work is attractive because it helps fill the valleys in the curve of production. For this reason alone, manufacturers would do well to investigate the possibilities of side lines and to analyze the experience of others in order to determine the factors influencing success and failure.

Building Boom Receives Check

Wave of Postponements of Large Projects in Greater New York, Spreading to Other Centers—High Material and Wage Costs and Delayed Deliveries Cause This Development—Car Shortage Is Diminishing

BY JOHN W. HILL, FINANCIAL EDITOR

EVIDENCE that the most stupendous building boom in the history of the country has struck a snag in unmistakable. The wave of postponements of large projects first preceptible in Greater New York, where building wages have been snowballing, is spreading to other centers. The movement is a protest against soaring costs, although partly due to delayed deliveries of material.

April building award records compiled by the F. W. Dodge Co. reflect the changed conditions. New awards for all kinds of construction in square feet in 27 northeastern states increased less than one per cent over March. One year ago there was an increase of 11 per cent between the two months. The increase in the dollar valuation of awards in 36 states was 7 per cent. Normally there is an expansion in April building of from 15 to 20 per cent. In both industrial and residential building, there were declines in April as shown by the Business Trend Chart.

Building costs, including labor and materials, now stand at 104 per cent above 1915, as measured by the Aberthaw Index, for a concrete factory structure, pictured in the Business Trend. This index has increased 35 per cent in a year. At the peak of the 1920 inflation boom the figure stood at 163 per cent above the 1915 base. Building is an important factor in the prosperity of the steel trade, and a cessation of construction would be a blow. There is not likely to be an immediate drastic cessation, however. It was perfectly clear at the beginning of the year that the vast construction program for 1923 could not be carried out, with available labor and materials. Some curtailment was unavoidable. This is taking place and after it is accomplished and the flight of prices checked, there probably will remain a substantial volume of building to be done.

That the peak of industrial activities has been reached is the view of some authorities. In March the Monthly Business Index, pictured in the Business Trend touched 147.4. In April it declined slightly. Of the six factors which make up the composite, pig iron, building and traffic increased while cotton consumption coal production and prices declined. A development of unusual interest has been the rapid fall of the net car shortage in the face of climbing car loadings. Total loadings for the last week of April were only 4 per cent under last fall's peak, while the shortage had dropped 70 per cent. Additional equipment and increased efficiency in handling freight are indicated.

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Steel Output Per Capita	Feb. 1
Commodity Prices	Jan. 11
U. S. Crop Production	Dec. 28
Long Time Trend of Wages	Aug. 3

The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	Average 1919
Business failures	356	375	362	408	328
Cash ratio Fed. Res. System	76.1	75.2	76.3	77.3	...
Loan rate, 4-6 Mo. N. Y. (per cent)	5-5¼	5-5¼	5-5¼	4¼	5-5½
Avre. 25 ind'l shares	$108.82	$107.10	$113.81	$95.66	$58.19
Aver. 25 rail shares	$61.59	$59.88	$63.65	$61.82	$82.97
Ave. 40 bonds	$77.39	$77.08	$63.46	$79.70	$93.00
Car loadings (week ended April 28)	963,694	957,743	938,725	758,286	*800,960
Bank debits 165 cities (000 omitted)	$9,527,257	$11,056,020	$9,513,161	$9,075,958	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	May 14 (close)	Week before	Mo. ago	Yr. ago
Sterling	$4.86	$4.62	$4.62	$4.65	$4.44
Francs	19.3c	6.64c	6.66c	6.66c	9.12c
Lira	19.3c	4.89c	4.87c	4.97c	5.26c
Marks	23.8c	0.0023c	0.0029c	0.0047c	0.34c

MONTHLY COMPARISON

	April	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$358,693,000	$334,000,000	$353,162,000	$71,450,000
Business failures:				
Number	1520	1682	2167	1336
Liabilities	$46,991,941	$48,393,138	$73,058,637	$22,723,000
Exports	$340,970,000	$341,162,000	$329,979,000	$207,000,000
Excess of gold imports	$8,533,235	$5,559,257	$10,664,000	†$630,716
Bureau of Labor Price Index	*159	157	142	100
Bradstreet's Price Index	147.8	150.1	126.6	100
Economist's British Price Index	4440	4392	4285	2717
Cost of Living Index	*159	157.5	154.7	100
New incorporations	$1,006,258,000	$500,819,000	$792,373,000	$172,301,000
Railroad net earnings	*$83,568,000	$38,903,000	$83,511,000	$59,900,000

*March. †Monthly average excess exports.

The Business Trend

May 17, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Business activities show slight recession from March peak; trade caution continues as speculative markets show signs of recovering from recent extreme pessimism; opinion prevails that present hesitation is lull between two buying movements, rather than beginning of long downward movement in industry.

BUILDING—Construction boom beginning to suffer from high costs; April brings decline in both residential and industrial awards in square feet; total building gains under normal increase.

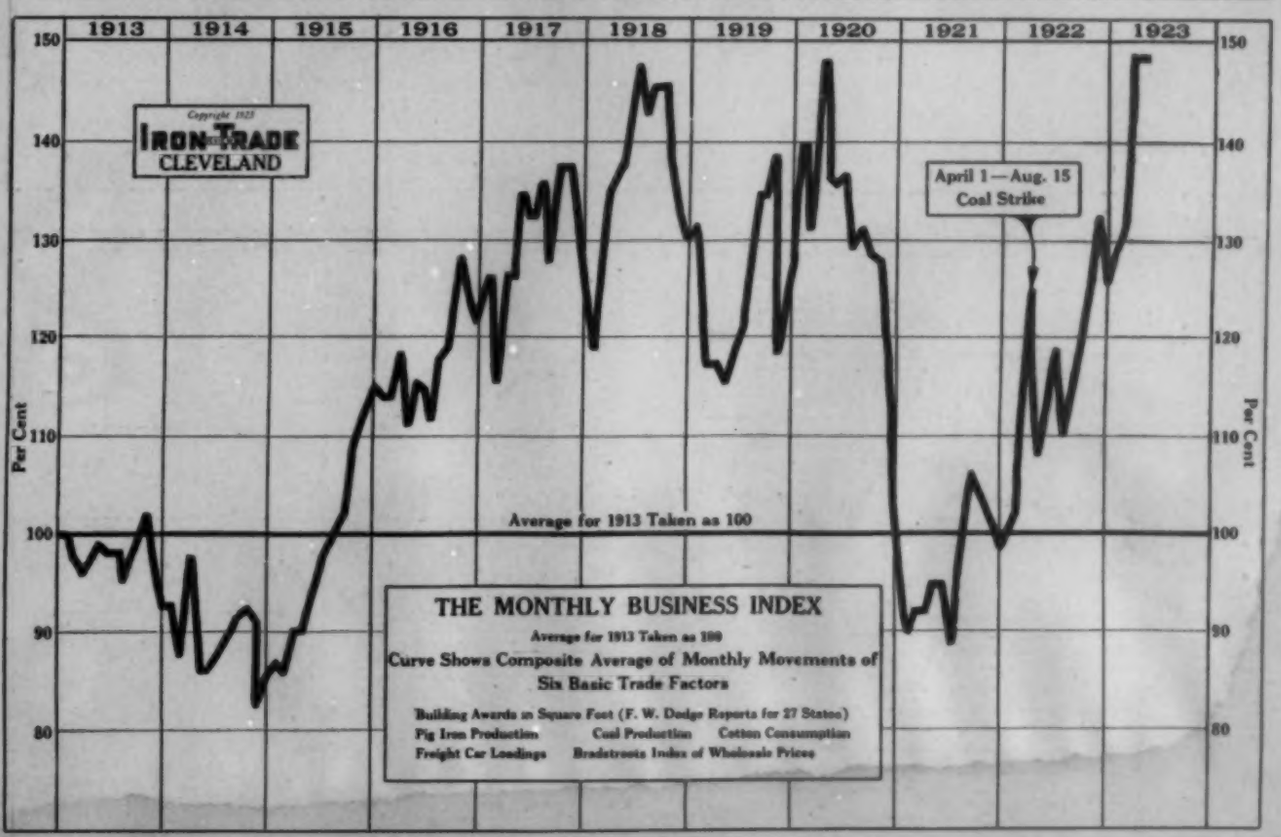
ABERTHAW INDEX—New chart pictures curve of cost of modern concrete factory structure compiled by Aberthaw Construction Co., Boston, Mass.; level now 104 per cent over 1915; up 35 per cent in year.

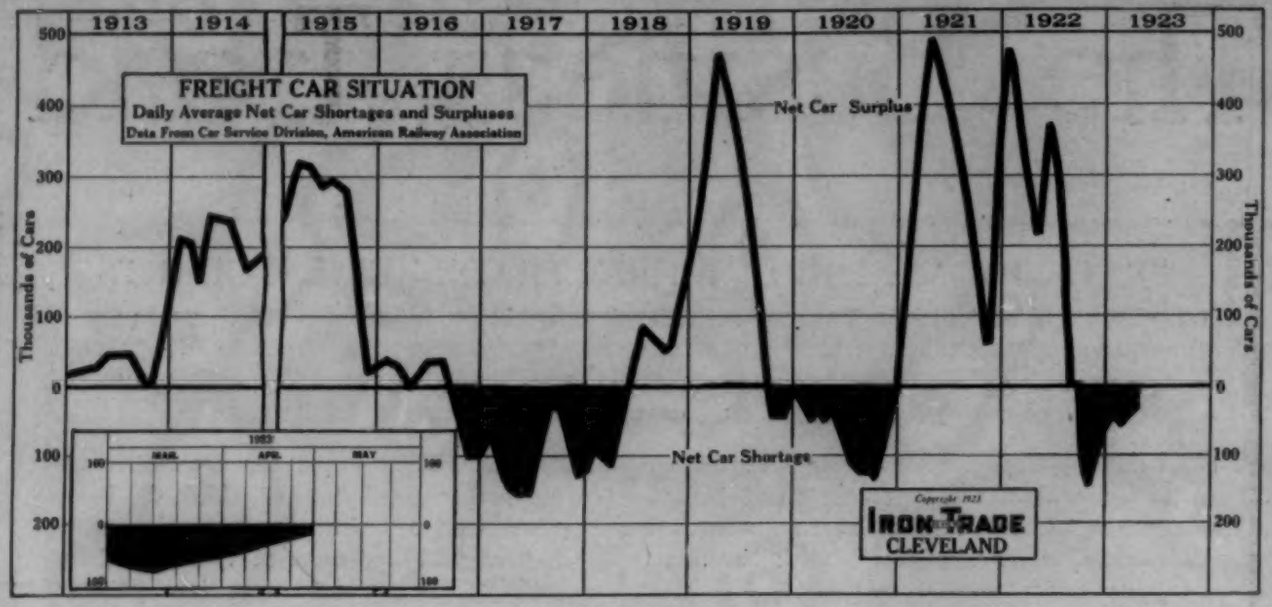
FREIGHT MOVEMENT—Although car loadings in last week of April were only 4 per cent under peak of last fall; car shortage has been cut 70 per cent; net shortage, last reported, 21,000 cars.

STEEL ORDERS—Save for December and November bookings of United States Steel Corp., decline for first time since February, 1922; total of 7,288,509 shows gain of 76 per cent over low point of Feb. 28, 1922.

WHOLESALE TRADE—New chart pictures trend of wholesale trade in six lines throughout the country; large gains shown over both 1921 and 1922; total below 1920, largely because of lower prices.

SECURITIES—Violent fluctuations mark movements of shares; recent recoveries succeeded by further decline as commodity price fall and trade conservatism impresses Wall street.




1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data From Car Service Division, American Railway Association
Net Car Surplus
Net Car Shortage
Thousands of Cars
500
400
300
200
100
0
100
200
1923
MAR.
APR.
MAY
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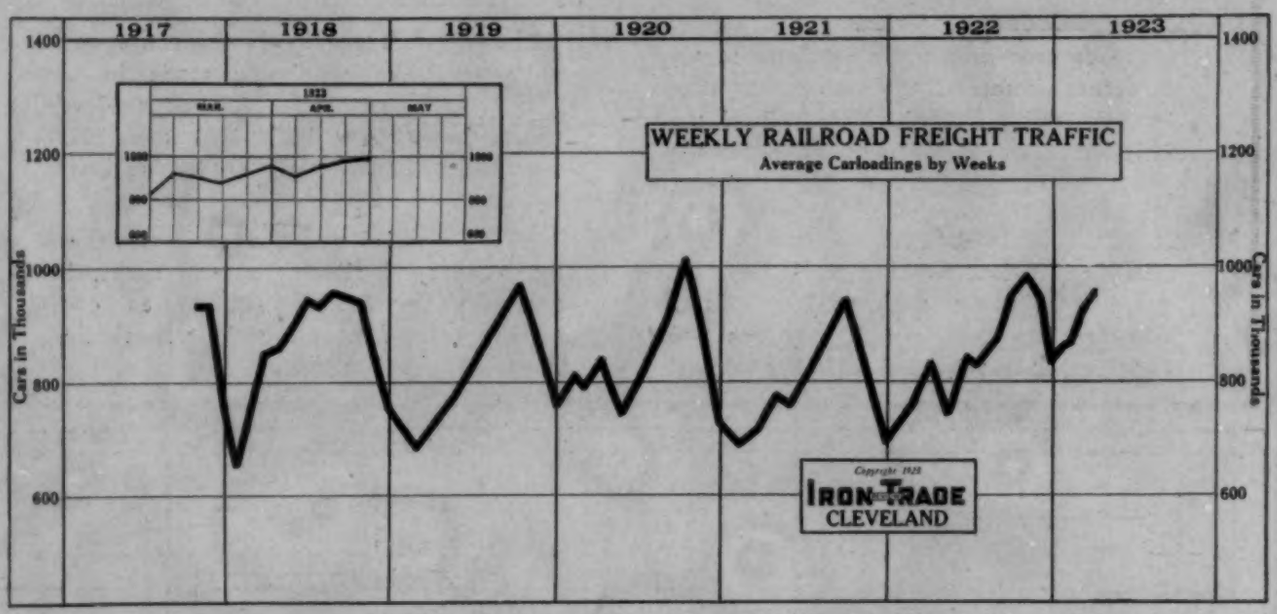
CLEVELAND


1917
1918
1919
1920
1921
1922
1923
WEEKLY RAILROAD FREIGHT TRAFFIC
Average Carloadings by Weeks
Cars in Thousands
1400
1200
1000
800
600
1923
MAR.
APR.
MAY
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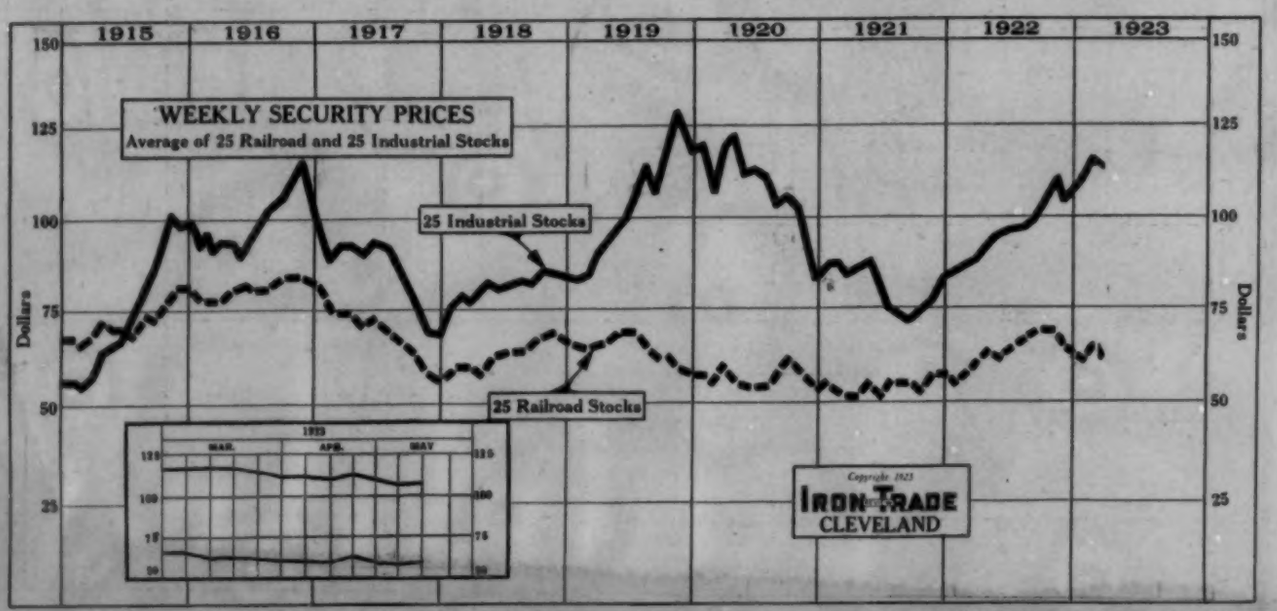
CLEVELAND


1915
1916
1917
1918
1919
1920
1921
1922
1923
WEEKLY SECURITY PRICES
Average of 25 Railroad and 25 Industrial Stocks
25 Industrial Stocks
25 Railroad Stocks
Dollars
150
125
100
75
50
25
1923
MAR.
APR.
MAY
Copyright 1923
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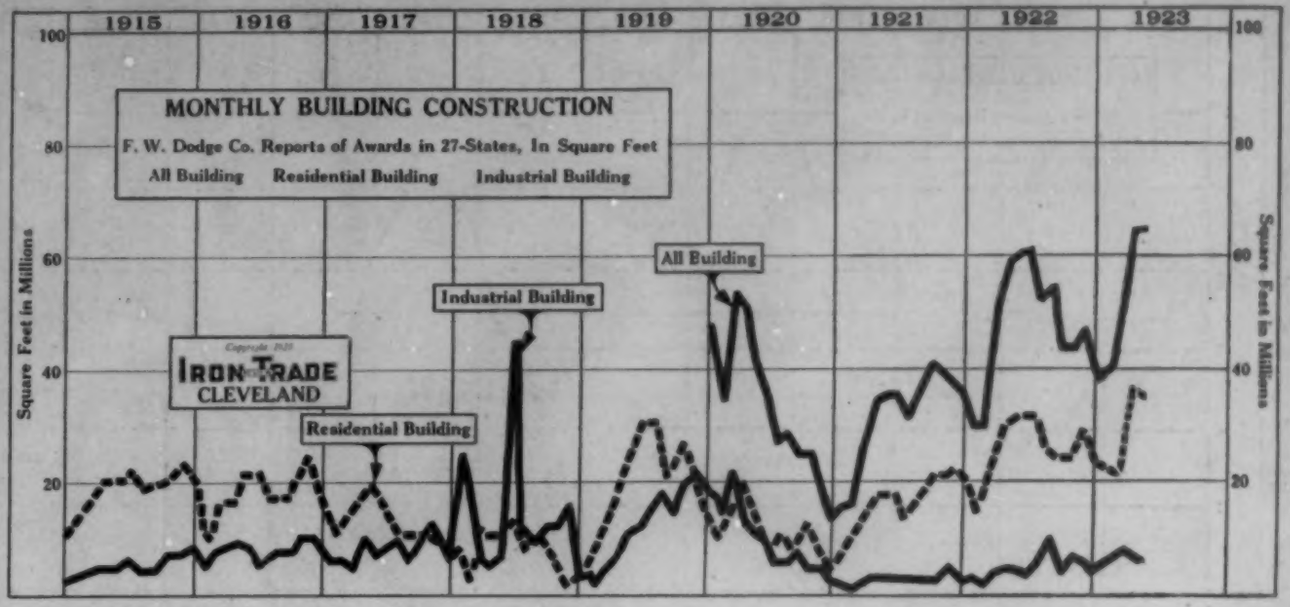
CLEVELAND


1915
1916
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1922
1923
MONTHLY BUILDING CONSTRUCTION
F. W. Dodge Co. Reports of Awards in 27-States, In Square Feet
All Building Residential Building Industrial Building
Square Feet in Millions
All Building
Industrial Building
Residential Building
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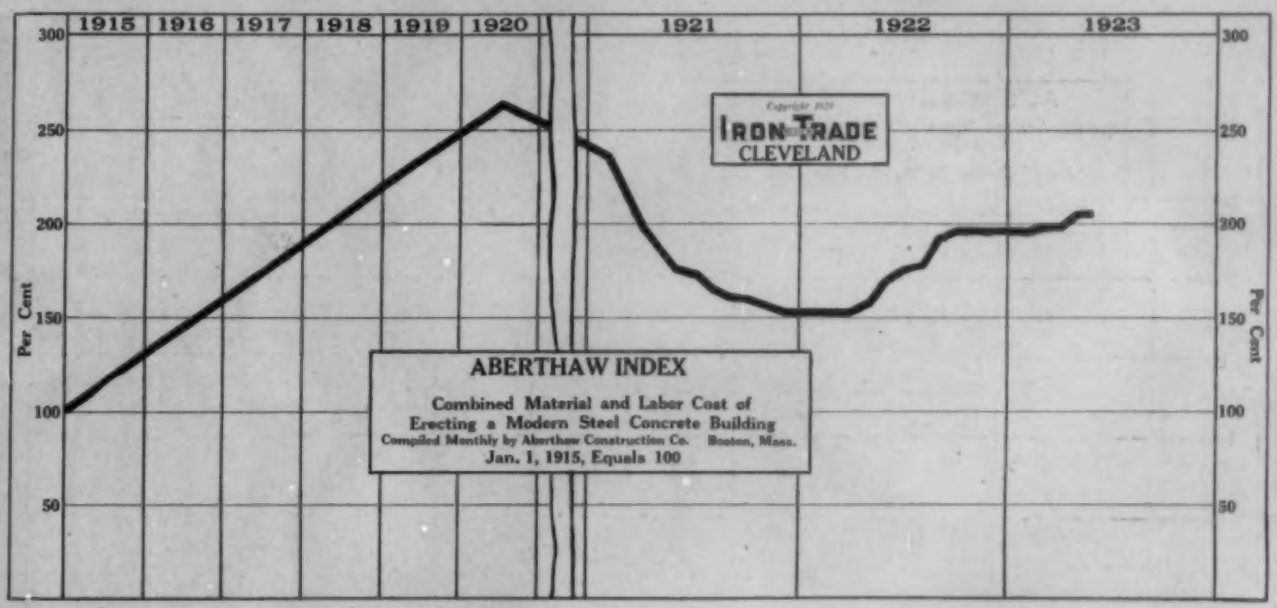
1915
1916
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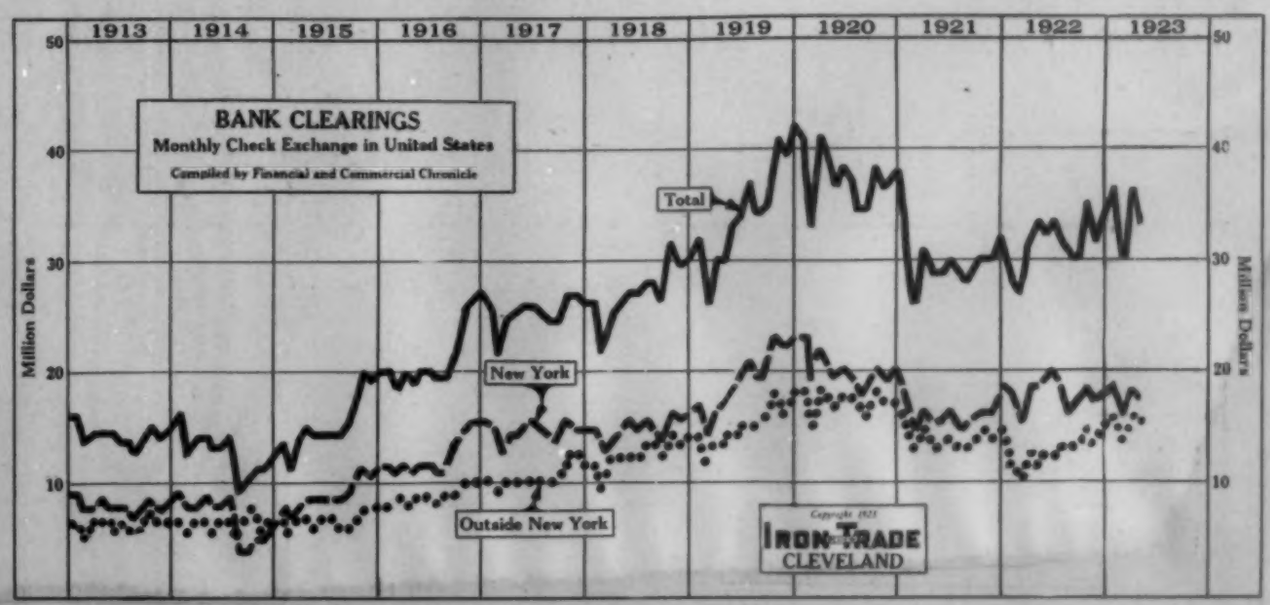
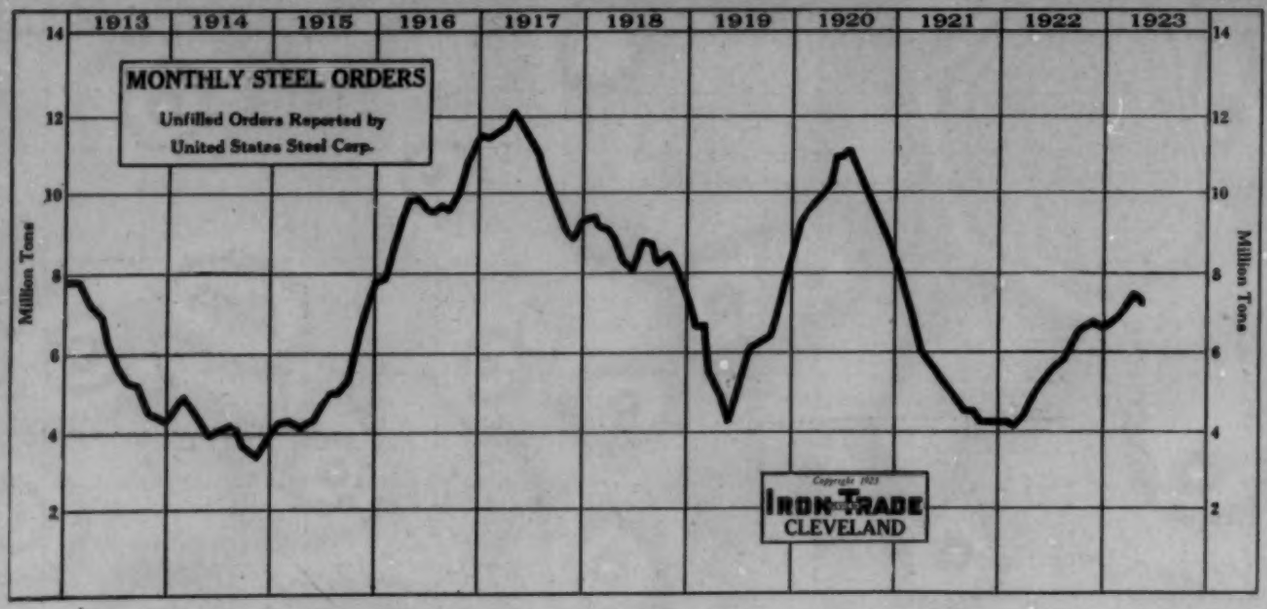
1918
1919
1920
1921
1922
1923
Per Cent
IRON TRADE
CLEVELAND
ABERTHAW INDEX
Combined Material and Labor Cost of
Erecting a Modern Steel Concrete Building
Compiled Monthly by Aberthaw Construction Co. Boston, Mass.
Jan. 1, 1915, Equals 100


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
BANK CLEARINGS
Monthly Check Exchange in United States
Compiled by Financial and Commercial Chronicle
Million Dollars
Total
New York
Outside New York
IRON TRADE
CLEVELAND


1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
MONTHLY STEEL ORDERS
Unfilled Orders Reported by
United States Steel Corp.
Million Tons
14
12
10
8
6
4
2
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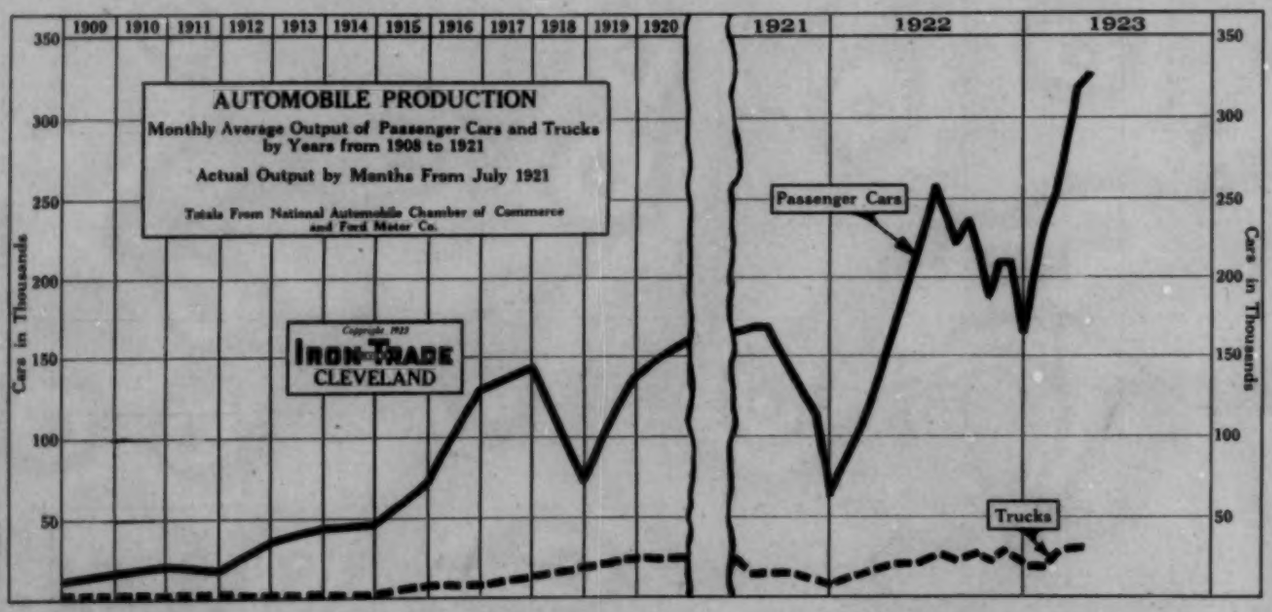
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
AUTOMOBILE PRODUCTION
Monthly Average Output of Passenger Cars and Trucks
by Years from 1908 to 1921
Actual Output by Months From July 1921
Totals From National Automobile Chamber of Commerce
and Ford Motor Co.
Passenger Cars
Trucks
Cars in Thousands
350
300
250
200
150
100
50
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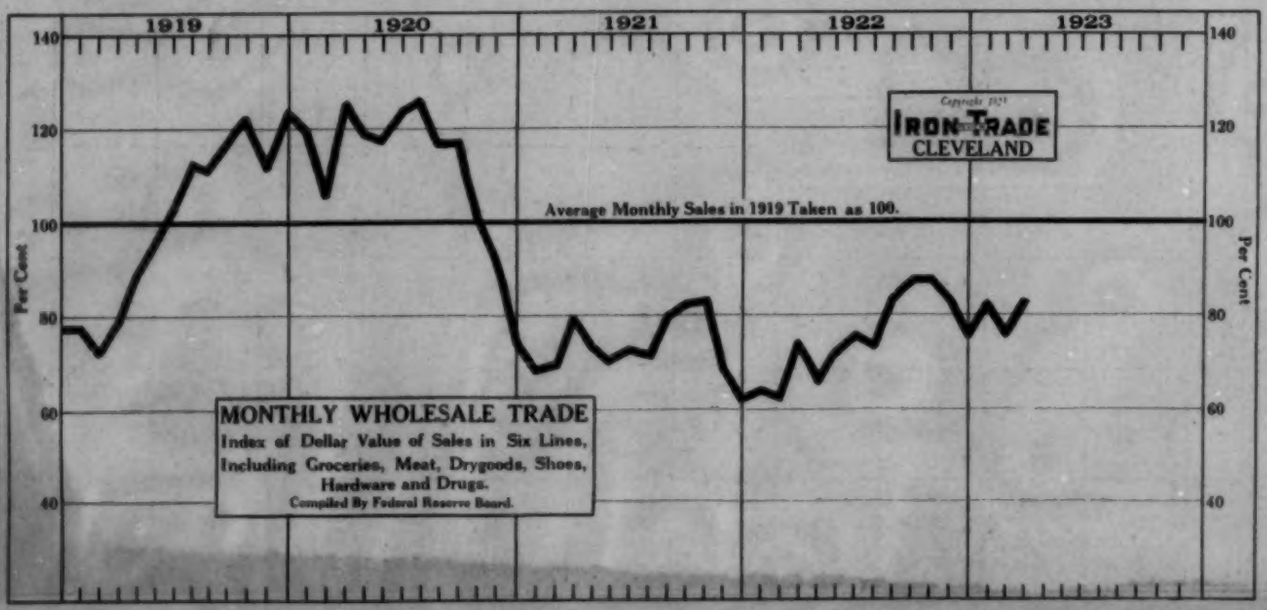
1919
1920
1921
1922
1923
Average Monthly Sales in 1919 Taken as 100.
Per Cent
140
120
100
80
60
40
MONTHLY WHOLESALE TRADE
Index of Dollar Value of Sales in Six Lines,
Including Groceries, Meat, Drygoods, Shoes,
Hardware and Drugs.
Compiled By Federal Reserve Board.
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Shipyards Repairing Locomotives

Loss of Shipbuilding and Repair Contracts by Yards Specializing in Government Work Compels Plant Officials To Enter New Field as a Means of Preserving Their Organizations—Success Is Encouraging

BY HERBERT R. SIMONDS

DISARMAMENT pledges dealt a severe blow to a number of large ship building plants which had specialized in navy work. The Fore River plant of the Bethlehem Shipbuilding Corp. probably suffered more severely than any other. Here cancellation of government contracts and the loss of government new business were chiefly responsible for a decline in number of plant workers from about 16,000 to 4,000. Obviously, with a large modern plant and an excellent working personnel company officials felt it highly desirable to keep the unit intact. To do this and to provide for the large overhead, more work had to be secured. Dickerings over the ship subsidy bill, the large number of idle shipping board vessels, and general conditions in the merchant marine field discouraged any attempt to fill up the gap left by the loss of navy work with general merchant vessel construction and repair. What then was to be done?

The author is associate editor at Boston of IRON TRADE REVIEW.

All Shipyards Face Problem

To a greater or less degree nearly all large shipyards have been faced with this same problem. Two lines of work are immediately suggested by the present needs of the country. These are repair and construction of locomotives and other railroad equipment and the fabrication of steel for building construction. This latter field offers an excellent means of taking care of ship riveters and possibly some boilermakers, but these groups form a comparatively small proportion of the normal ship plant personnel, so that specializing on the fabrication of steel would mean a large increase in the number of riveters and a decrease in many of the other crafts. In the way of equipment changes also would have to be made as most of the general machine shop equipment could not be adapted to this line of work.

The repair of locomotives, on the other hand, utilizes nearly all of the regular shipyard trades and requires comparatively little change in shop equipment. Moreover, there is something similar in the general product. Both ships and locomotives are used in transportation and this furnishes a link of no mean importance between the industry of shipbuilding and that of locomotive construction. The country is in urgent need of locomotive re-

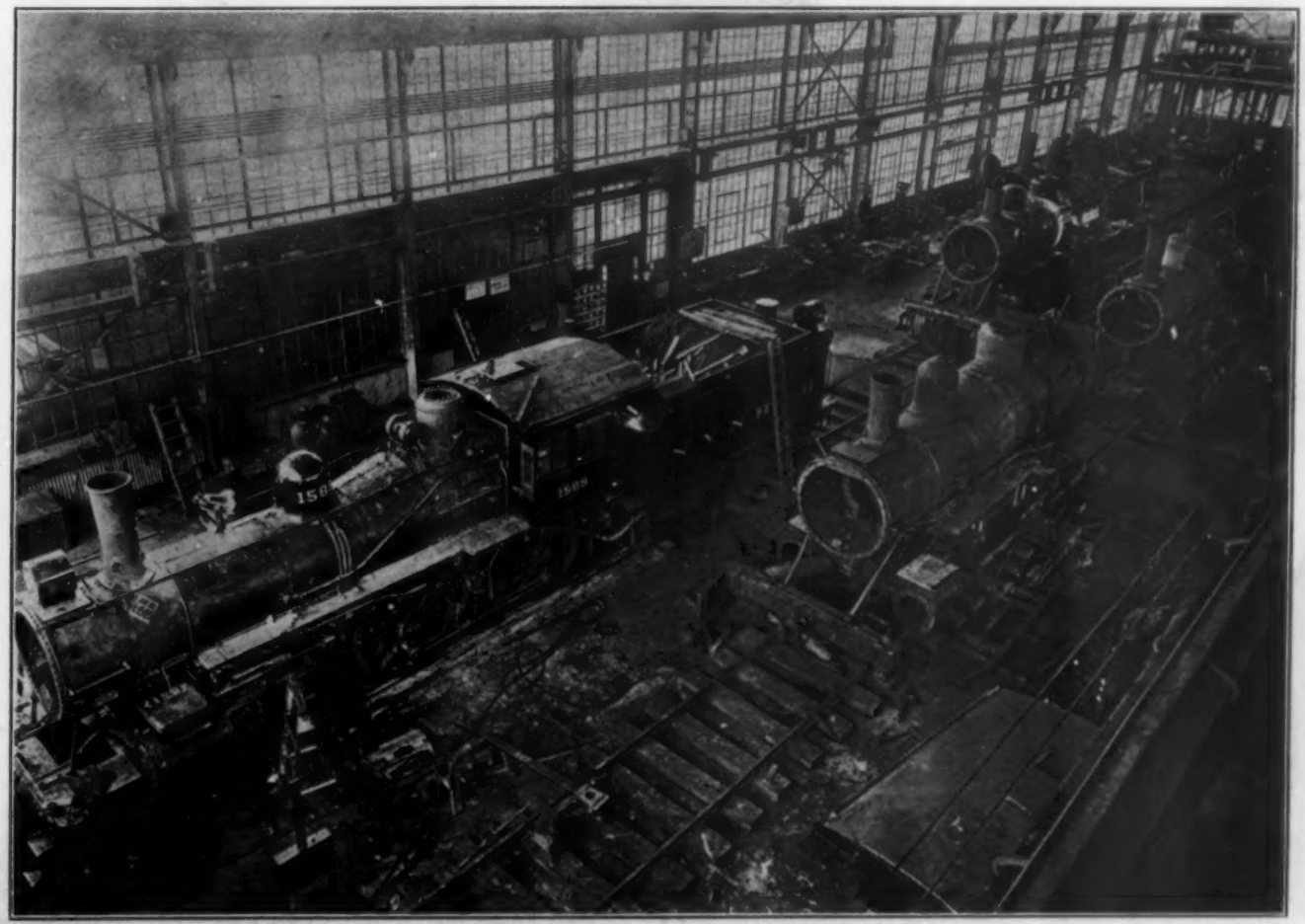
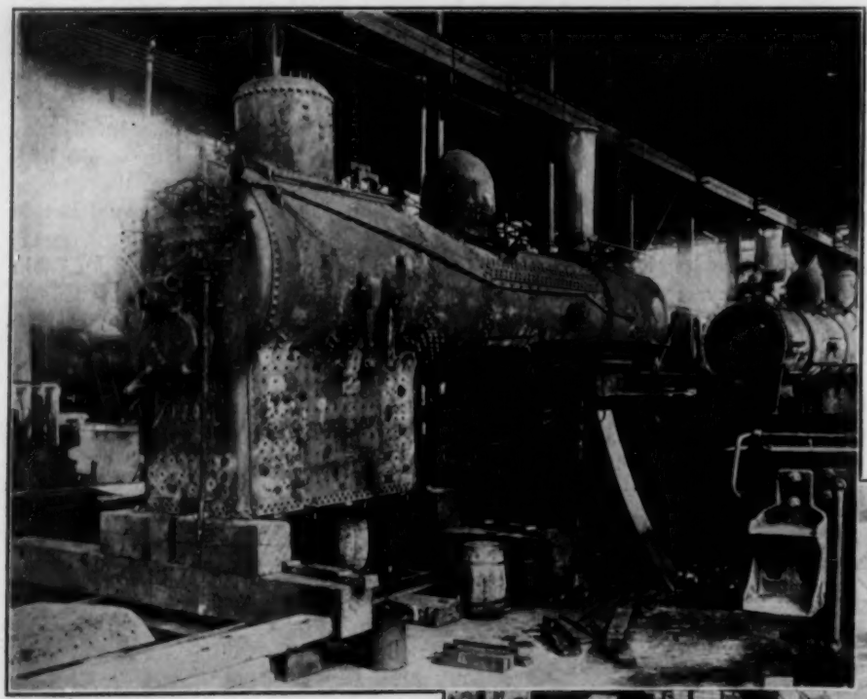


FIG. 1—TRACKS LAID ON THE CONCRETE FLOOR TRANSFORM A SHIPYARD MACHINE SHOP INTO A LOCOMOTIVE REPAIR SHOP. THIS METHOD OF LAYING THE TRACK PROVED BOTH SATISFACTORY AND ECONOMICAL

pairs and of new transportation equipment generally. In fact, as one shipbuilder has pointed out, the demand for railroad equipment far more offsets the reduction in demand for ocean vessel tonnage. Considering these points the repair of locomotives seems to be one of the big fields which must be turned to at the present time to save the country's large shipbuilding plants. The Fore River yard of the Bethlehem Shipbuilding Corp. was one of the first plants to start this line of work, and at present it is probably engaged in more extensive locomotive repair work than any of the other yards so that some features of the experience at this plant are of special interest.



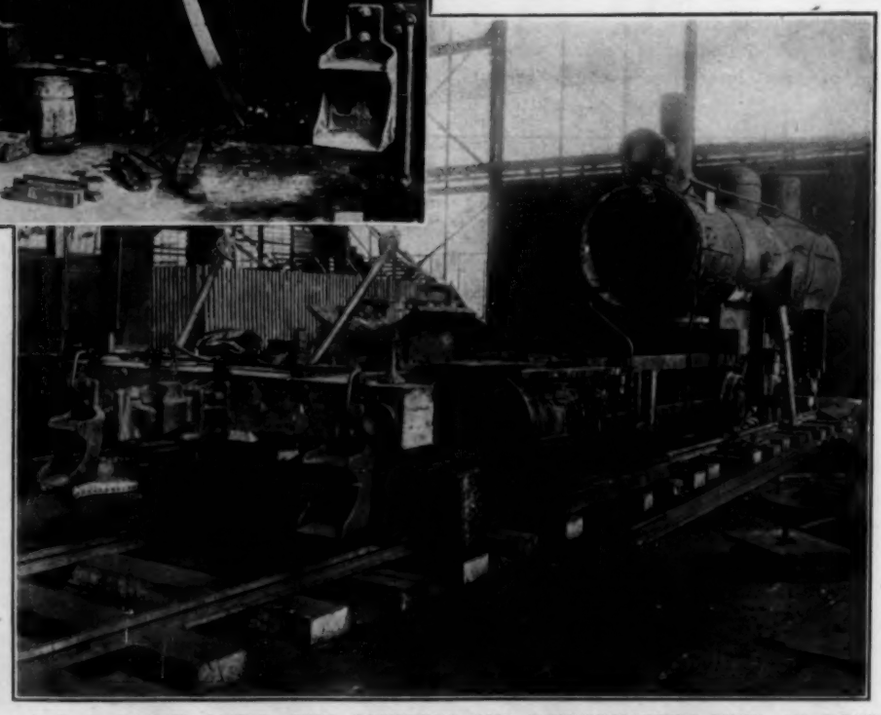


FIG. 2—(UPPER LEFT)—SHIP RIVETERS AND BOILERMAKERS FEEL AT HOME WHEN WORKING ON LOCOMOTIVE BOILERS AND FIREBOXES. FIG. 3—OFTEN, AS SHOWN IN THIS VIEW, IT IS NECESSARY TO START AT THE BOTTOM AND COMPLETELY REBUILD A LOCOMOTIVE WHICH HAS COME IN FOR REPAIRS

It is surprising to find upon investigation how many of the jobs in connection with overhauling and repairing locomotives fall directly in line with the customary work of a shipbuilding plant. Checking over the list of shipyard crafts and marking off those which are used for the repair of locomotives leaves few unmarked. Machinists are used in repairing the valve gears, truing up bearings, and in general work at nearly all points of the reconstruction. The ship boilermakers are transferred with little difficulty to the repair of locomotiveboilers. Ship painters quickly learn to paint locomotives and tenders. The electrical department of a shipbuilding plant comes in handy in repairing locomotive generators and in taking care of the wiring which in modern construction is extensive. The pipe and copper shops of a shipyard are used for general locomotive piping. Tinsmith shops take care of the lagging. Joiners build cab decks and other light wood construction. Ship carpenters build bumpers and tender decking, and ship fitters woodwork on tenders. Ship riveters repair steel plate work on tenders. The blacksmith shop and the foundry furnish important service in the repair of tie rods, smoke stacks, boiler supports, and many heavy pieces in connection with both the locomotive and the tender.

Adapting Shop Facilities

A large machine shop of a shipbuilding plant requires almost no change to enable it to take care of a moderate amount of locomotive repair work. However, for a large volume of this work, the exclusive use of one complete shop is advisable. At the Fore River plant a large new building devoted during the war to turbine work was idle at the time the locomotive repair work was taken on. This building, therefore, was turned into a locomotive repair shop. The building which is about 100 by 200 feet is divided into two bays each 50 by 200 feet. Each bay has two 15-ton traveling cranes which serve the entire area. One end of one of the bays is shown in Fig. 1. The entire work of adopting this building to its new purpose consisted in laying four standards gage tracks, two to each bay, and connecting these with the yard spur. As the ties for the track were laid directly on the concrete floor, the construction was inexpensive. Rails were picked up at different points in the yard, thus the entire work of arranging the plant so that 13 locomotives could be repaired at one time cost less than $1500.

In addition to the building just mentioned a small space in the general machine shop which is close by has been taken over for locomotive work in order to secure two features, namely, the use of the 75-ton crane which operates in that shop, and the use of a pit below one of the tracks. In this second shop a space of about 50 by 50 feet is devoted to locomotive work, and these combined facilities make it possible for the company to turn out from three to four locomo-

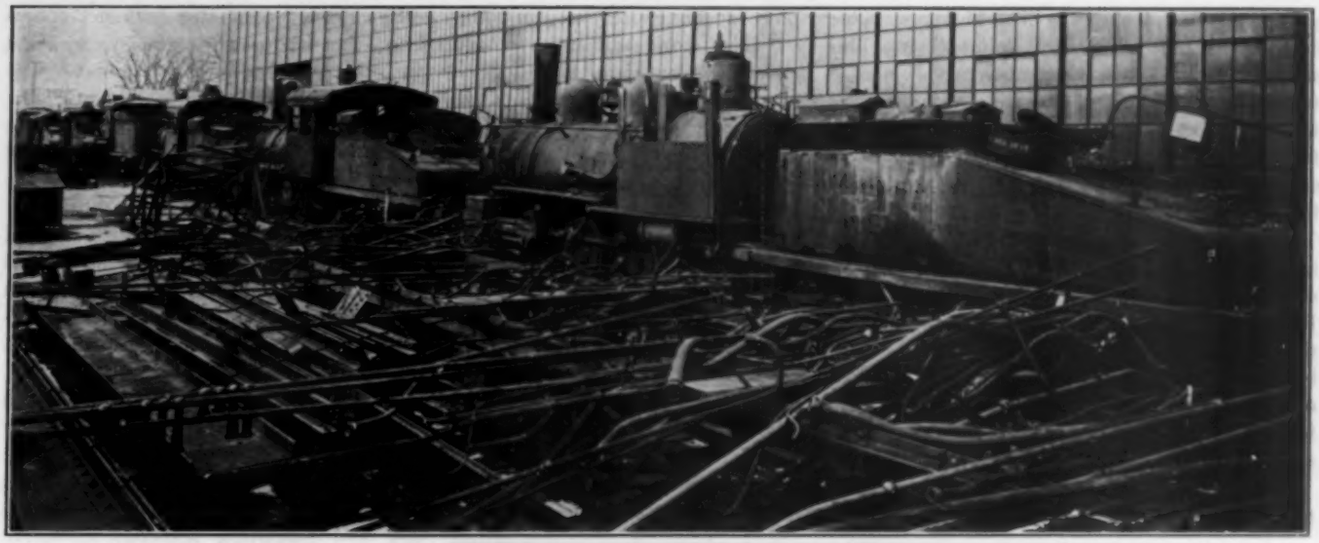


FIG. 4—LOCOMOTIVES RECEIVED FOR REPAIR ARE FIRST STRIPPED OF ALL PIPING WHILE WAITING IN THE YARD SIDING

tives a week. Nine locomotives were completely overhauled in March with green crews and with the unavoidable delays coincident with any new work on such a large scale.

A siding or spur track, of course, is necessary if any repair work at all is to be done. The Fore River plant is particularly fortunate in having ample siding space and close connection to the main line of the New York, New Haven & Hartford railroad. The plant is also fortunately located near the large Readville repair shops of this railroad. Without ample track facilities the handling and storage of locomotives which are to be repaired often presents a difficult problem. Railroads do not want to be held to any fixed time limit in the delivery of locomotives for repair, and it is safe to say that for successful handling of general railroad repair work, storage space outside of the shop should be at least equal to the amount of work turned out in a month.

Locomotive repairs are given different classifications according to the amount of work which is to be done. Most of the work undertaken at the Fore River plant follows under classification 3 and 4 and embodies complete overhauling. When a locomotive is received it is first stripped of all piping. This often is done in the

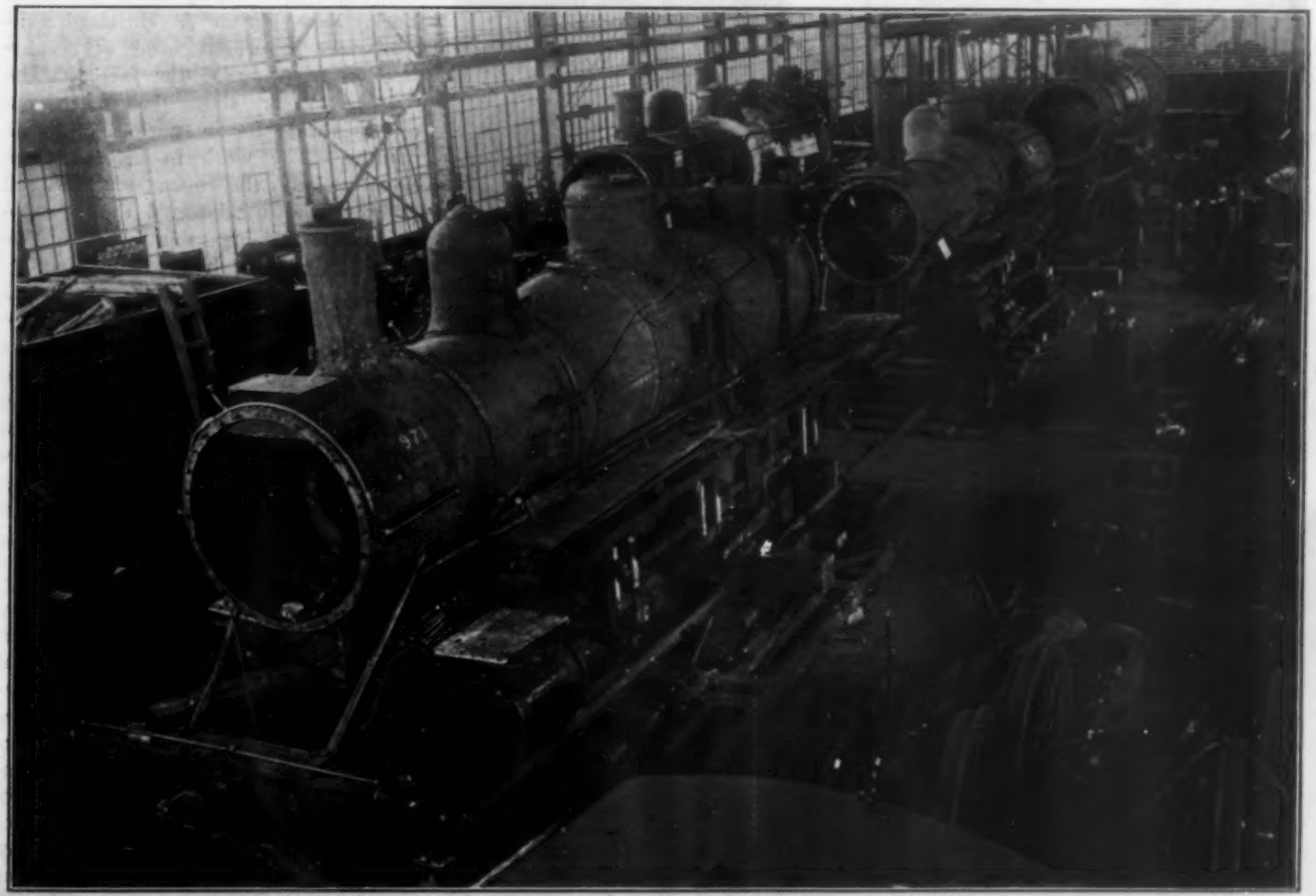


FIG. 5—ONE OF THE FIRST JOBS IS THE REMOVING OF THE BOILER TUBES. THIS IS ACCOMPLISHED BY MEANS OF THE OXYACETYLENE TORCH

yard, and Fig. 4 shows a line of locomotives in the process of being thus stripped. Next the locomotives are taken to the main machine shop where the cab is removed and transferred to a cab repair section which occupies a balcony at one end of the building devoted to locomotive repair. This building is called the M. B. building. Cabs on this balcony may be seen at the extreme upper right in Fig. 1. Next in the repair sequence the complete body of the locomotive is taken off of the wheels and placed on temporary trucks which are used for transportation as the work progresses.

Figs. 2 and 5 show something of the nature of work on complete over-

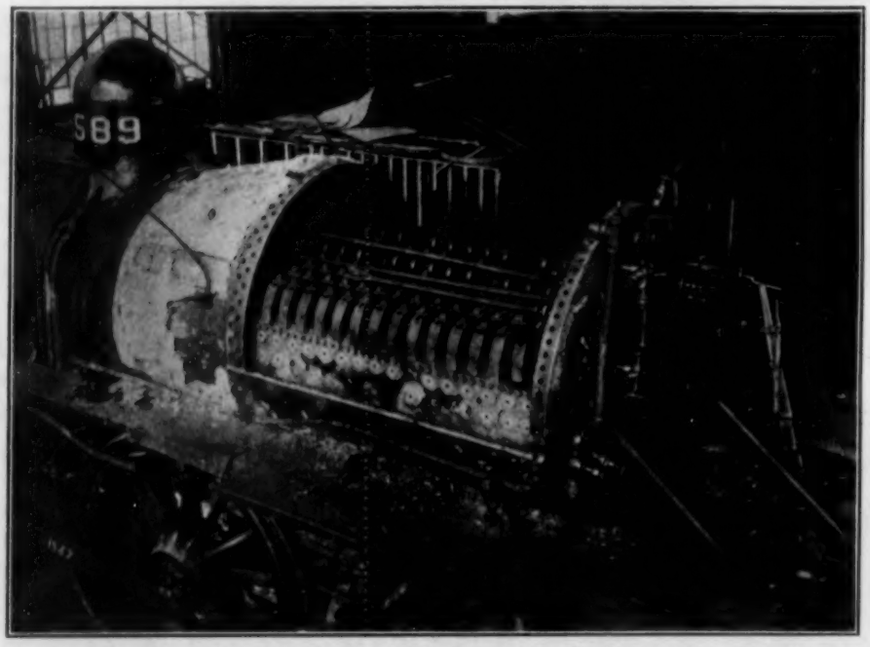


FIG. 6—A VIEW OF A PARTIALLY STRIPPED LOCOMOTIVE. AS EACH PART IS REMOVED, IT IS PAINTED WITH JOB NUMBER SO THAT IT WILL NOT GET LOST

hauling of locomotives. The cost of material and labor is charged against the order number of each unit. The regular railroad locomotive numbers are taken as the shop order number and as soon as stripping starts tags bearing this number are attached to each part. One of these tags is shown in Fig. 1. Early in the process of overhauling all tubes are taken out of the locomotive boiler and the boiler is scaled and cleaned throughout. Usually a new firebox is necessary and in any case some repair must be made to the firebox side sheets or the wrapper plate outside of the firebox. When boiler tubes are removed they are cut off with the oxyhydrogen torch and this, of course, means that they are too short to be used again in the same place. These tubes are repaired by first cutting clear of any defects at each end and then butt-welding on a new piece approximately a foot long. This is special work and unless there is a large quantity of it to be done over a period of considerable time it would hardly be advisable to do it at the shipbuilding plant. The tubes, however, are comparatively light and may be sent to some shop making a specialty of this work. At present at the Fore River plant new tubes are being used to replace the old ones and the old tubes are sent to the Readville plant of the New York, New Haven & Hartford railroad.

Electric welding occupies an important place in locomotive repairing, but this is a decidedly familiar operation in the construction of large steel vessels, and, therefore, no special adaptation is necessary. As shown in Fig. 24, for instance, it might be necessary to remove half of the side plate shown in the foreground. This would be cut off square and a new piece cut to fit would be placed in position and the joint butt welded. Such a repair is permissible only where the surface is held by stays. On the boiler proper a defective place would be repaired by a riveted lap patch. Work, of course, must conform to interstate commerce commission requirements and this governs many of the points in connection with repairs.

Handling Special Work

Auxiliary pieces such as air compressor, injector, generator, etc., usually are taken off and sent to specialized departments for repair. Practically every generator which comes into the shop must be overhauled and this is done without difficulty by the ship's electrical department. The air compressor is a somewhat more specialized piece of apparatus and wherever repairs are extensive the whole compressor is sent to the compressor department of the railroad shops. New tanks, however, are made up in the tinsmith shops; castings in the foundry; and braces, hand rails and handles in the blacksmith shop. Painting is necessary on all work. This is done mostly by compressed air spray. Fig. 6 is a detailed view taken about midway of the disassembling process. This shows the boiler construction and the regulating and insulating material surrounding it. Many parts such as grates, firebox doors and bells are either bought from the railroad or else supplied in accordance with the terms of the contract. This necessity of buying new parts which are stocked by a railroad and which, of course, are not carried by a shipbuilding plant causes some complication in the adjustment of contract price.

Bidding for Work

At the time the Bethlehem Shipbuilding Corp., Ltd., decided to go into locomotive repair work, the New York, New Haven & Hartford railroad was in urgent need of outside assistance, owing to the fact that its railroad repair shops had been out on a strike for a period of some months. The work to be done was thrown into the open market and different shops submitted their propositions for doing this work. The Fore River yard, being in a peculiarly advantageous position, secured a contract for the repair of 50 locomotives. Of this number over 25 have been delivered to date. The progress on the repairs to these locomotives has been unusually good and the workmanship has been entirely satisfactory to the railroad. At the present time there are approximately 500 men employed on this work at the Fore River plant.

The National Association of Cost Accountants, 130 West Forty-second street, New York, publishes monthly a special cost literature bulletin as one of the features of the service given to members. Practically all of the important articles on cost accounting and related management topics published in trade magazines and business papers are listed. In cases where the name of the article does not indicate clearly its contents short notes explaining the nature of the article are included.

Electrochemists Advance Abroad

Progress in South America Linked Closely with Development of Available Water Power—Argentina and Brazil in the Lead—In Far East Japan Offers Greatest Opportunity for Future Work

BY C. G. SCHLUEDERBERG

ELECTROCHEMICAL or electric furnace development on any commercial scale requires large amounts of electric power at low cost; therefore, in considering opportunities abroad for the electrochemist it is necessary to give thought to the power resources of the locality under observation, as these are so intimately allied with the possibilities for the successful development of the industries for which the electrochemist is responsible.

In South America, the west coast countries of Peru and Bolivia, with their large mineral wealth and mining operations extending back over hundreds of years to the time of the Incas, naturally appeal to the imagination as fertile fields for electrochemical activities. Copper, silver, tin, vanadium and other ores are mined in quantities and, in the case of the copper, refined locally to a high degree of purity in large smelters of the most modern type; the final purification by electrolysis is, however, not carried out on the ground but usually at some of the large refineries in the vicinity of New York, the metal is shipped containing upwards of 96 per cent copper or copper and silver.

In view of the fact that this metal is shipped in such a pure state, and that it can receive final purification in existing refineries close to the markets, there is at the present time no necessity for the investment of the additional capital which would be required for the building of an electrolytic plant on the ground. A decided change in labor or power rates of existing electrolytic refineries, or in market conditions, might possibly justify such an electrolytic plant in the future.

Water Power Available

Water power, while not over abundant on the Pacific side of the Andes, is available on the eastern slopes in quantities. Present transportation facilities to the sites of such power, as well as conditions inherent to the tropical climate of that region, while bad, cannot be considered as insuperable obstacles. Many surveys have been made and it is certain that power developments will take place.

Precious Metals in Peru

Considerable experimental work along electrochemical lines has been done by one of the larger companies in Peru, with a view to the working out of a satisfactory process for extracting the silver from certain of the local complex ores which so far it has not been possible to work on a commercial scale. Should the results of this research prove satisfactory, it is quite likely that an electrochemical plant of size would be erected in the Cordilleras of the Peruvian Andes in the neighborhood of La Oroya or Cerro de Pasco. The opportunities for the electrochemist in connection with the complex silver ores of Peru loom large indeed. Undoubtedly ores of many of the other less common metals will afford equally attractive possibilities to the electrochemist with enough pioneering spirit in his makeup not to be deterred by primitive living conditions and the discomforts of working at the high altitudes which surround the deposits of the precious metals in this country, the fabulous wealth of which was first revealed to the then civilized world by the indomitable Pizarro almost 400 years ago.

In Bolivia, renowned for its large deposits of rich tin ore as well as of copper, silver, and other useful and precious metals, electric tin reduction furnaces have been tried, but, at least up to the time of the writer's visit a few months ago had failed to prove commercially successful, the cost of carbon in the form of coal required for reduction purposes being one of the contributing factors. Here again the opportunity for the electrochemist is great. Just as in Peru, water power is available in the tropical sections of Bolivia, and the promise of large oil developments in the central and eastern parts offers the chance of cheap fuel for steam stations, so that from the standpoint of power the establishment of electrochemical or electrothermal processes in this country so rich in natural resources is entirely feasible.

Farther south along the west coast, the northern half of Chile, is another country richly endowed with minerals and containing what is probably the largest copper mine in the world, as well as large deposits of iron ore, saltpeter, etc., but with an almost entire absence of water power or even rain, while the southern portion, not so richly endowed with metal-bearing ores, is blessed with an abundant rainfall, water power, and coal. However, the distances are great and present indications for long distance electric power transmission not promising. In spite of this handicap, electrolytic refining of copper is carried out on a large scale at the Chile Exploration Co.'s copper mine in northern Chile, but the copper ore here is in the form of salts readily solubie, from the solution of which the metal can be obtained more readily and economically by electrolytic means than otherwise, in spite of the necessity of generating electricity at an oil-fired steam plant on the seacoast many miles distant from the mine, firing the boilers with oil transported by ship from Mexico, and the transmitting of energy over high tension lines at 110,000 volts. Even the water for lixivation of the ore, as well as for all other purposes at this mine, has to be carried for many miles through large pipe lines from distant mountain sources.

Development Monument to Americans

The plant of this company represents the one outstanding electrochemical development on the west coast of South America and is a monument to the American electrochemists through whose efforts the many details incident to the successful development of a commercially-successful process for the extraction of ore on a large tonnage basis—not the least important of which was the production of an insoluble anode—have been worked out satisfactorily.

Indications of oil resources near the

From an address presented at the New York meeting of the American Electrochemical society, May 3-5. The author is assistant to manager, supply department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and retiring president of the society.

eastern boundary of Chile, as well as further developments in long distance power transmission, give promise of additional opportunities for the electrochemist in this progressive South American republic so far-famed for its mineral resources.

In the front rank of those countries bordering on the east coast and readily reached by a two-day journey from Chile over the famous Transandine railway is the republic of Argentina, for whose wealth, cattle and cereals and not minerals are responsible. Argentina is almost devoid of water powers of any size—even in mineral resources she is almost totally lacking. It is true that near the northeastern border are the Falls of the Iguassu, reputed to be capable of delivering many hundreds of thousands of horsepower, and on the western border the waterfalls of the Andes, but these are so far removed from present centers of civilization or human activity of any kind that even modern electric transmission developments using 220,000 volts do not indicate that it is yet advisable to attempt the harnessing of these waterfalls. As a matter of fact, the Falls of the Iguassu, located almost at the point where Brazil, Argentina, and Paraguay touch, are nearer the center of industrial activities in Brazil than Argentina.

The progressive republic of Uruguay much resembles Argentina both in resources and in that at the present time there are no electrochemical or electric furnace developments, with the possible exception of one or two small steel furnaces for use in foundries, so that in neither of these countries does any immediate opportunity exist. Brazil, rich in mineral resources and with great quantities of waterpower distributed over her vast area, offers much in the way of opportunity to the electrochemist. He will find here great beds of rich iron ore, immense deposits of manganese, vast stores of the rarer metals and elements so widely used in the industries, fluxes and reducing agents in the form of charcoal from the rapidly maturing Eucalyptus tree, and waterpowers in abundance near the seacoast and existing centers of civilization, many of them already developed with power lines extending over wide stretches of territory.

Brazil Is Well Advanced

The most important electrochemical development is that of the Brazilian Electrometallurgical Co. at Ribeirao Preto, where two 30-ton electric pig iron furnaces have been erected, together with two 6-ton bessemer converters for the direct conversion of the hot iron into steel, as well as a 6-ton electric steel furnace for the treatment of such steel as may be received from the bessemer converters and require special doctoring in order to bring it up to the desired composition. In addition, there are rolling mills for plates and shapes, reheating furnaces, and the necessary auxiliaries. Recent reports from this operation indicate that so far the plant has worked only on scrap metal, with some pig iron, which is melted in the steel furnace. They have rolled as much as 20 tons of round and square bars per day, which have been offered at prices 10 per cent below quotations on similar foreign material. Owing to the railroad not having been completed to the iron ore mine, no ore has yet come in and hence reduction operations have not commenced. It is reported that the company has been able to book enough business to keep the plant busy for the next year or more.

Americans Play Prominent Part

Whereas on the west coast of South America practically all electrochemical and electrometallurgical processes and operations are carried on by Americans and Europeans, on the east coast, as in Brazil, this work is being carried on and financed in a large measure by Brazilians, although even here the apparatus of American or European manufacture, so far has generally been installed by American or European engineers.

A second plant for the electric cupola reduction of the local deposits of iron ore on a much larger scale is under active consideration in this same district, and it is reported that the rather large financing required is being carried out successfully and that steel rails will be the principal product.

With abundant cheap power readily available from the numerous waterfalls and plentiful deposits of iron ore of an excellent grade, as well as manganese and other necessary alloys and fluxes, and a local market for pig iron and steel products, the only material thing which seems to stand in the way of Brazil's becoming a considerable producer of iron and steel products seems to be the question of suitable reducing agents such as coal or coke. Here it becomes necessary to substitute charcoal usually obtained from Eucalyptus trees which mature within five years in this tropical climate. The wood from these trees which are planted in large numbers, regularly serves as fuel for railways and industrial plants. The fact that in the electric cupola carbon is consumed only in proportion to the amount of ore reduced, and that it does not have to serve the dual purpose of both fuel and reducing agent, is a factor of no mean importance where only such an expensive form of carbon is readily obtainable.

Outside of possibly a few electric furnaces for foundry use, the above summary covers electrolytic and electrothermal activities in six of the principal countries of South America. Reports from the other countries, not visited, do not give any immediate encouragement to the electrochemist, but undoubtedly certain of the northern countries when further developed, will offer opportunities similar to those of Peru and Bolivia.

Turning to the Far East, we find one country at least with a development along lines approaching our own or that of Europe. Japan is rich in water powers, many of them already developed on a large scale and high tension transmission lines are everywhere. Her 70,000,000 people are emulating western civilization and making industrial progress as rapidly as possible. This assimilation of western civilization, started not more than two generations ago, has attained results which command admiration.

The war gave an impetus to the industries of Japan as to those of other countries. Electrochemical and electrothermal came into being, these including manufactories of soda, chlorate, carbide, ferroalloys, pure pig iron, electrolytic zinc, copper, etc., along with others and just as in other countries some of them since the war had difficulty in maintaining their existence. Today general business in Japan, while quiet, is improving, but many of her electrochemical industries are working only part time or are shut down.

Ferroalloys Produced Electrically

One plant located at Odera, 150 miles north of Tokyo, almost on the shores of Lake Inawashiro, close to the immense power plants of the power company bearing the name of that lake and one of the first large high tension systems in Japan, was established in the fall of 1916, and despite many handicaps, completed in less than six months, and devoted largely to electrolytic extraction of zinc and the production of ferroalloys.

(*Concluded on Page* 1458)

Compares Practice in Gray Iron

Data on Automotive Castings Are Compiled from Questionnaires Returned by 16 Plants—For Engine Cylinders Scrap Steel of Fairly Good Section Such as Rails Charged to Mixture Produces Best Results

BY H. B. SWAN

DISCUSSION of the general practice of using gray iron mixtures for automotive castings led to the sending out to the representative foundries supplying the automotive industry questionnaires covering the data relative to the subject. About 25 foundries comprised the list prepared and replies were received from 16. Many of the latter were incomplete in the answers to questions asked. Regarding the cupola data asked for, it was thought interesting to find out whether the present day practice approaches anything which might be called standard. Furthermore, the writer desired to check up some personal observations regarding the total carbon content. The amount and condition of the total carbon is to the writer a point of prime importance for such work as cylinders. Fuel ratio, the percentage of pig iron, remelt and steel are important both technically and economically. The amount of remelt which can be used without detriment to the casting is a point often discussed.

The question of what mixture the foundrymen shall use depends on several factors. It may happen that the buyer furnishes certain specifications by which the foundryman must be guided to some extent in compiling his mixture. Special physical tests are not uncommon. In other instances the composition is left entirely to the judgment of the foundryman. Of course, good machining qualities and freedom from the usual foundry defects are understood. As an instance of special requirements, the writer recalls a rather difficult exhaust manifold which the foundry was called upon to make. This casting was polished all over the outside surface previous to a bake enamel. Being a thin walled casting with some comparatively heavy bosses and flanges, it required considerable experimenting to get the iron which filled all requirements satisfactorily. Another instance, is a company which requires that the barrels of the cylinder block shall conform to a Brinell test within certain limits. It often requires the best judgment of several years' experience and some experimental work to meet special specifications for a peculiar casting.

Automotive castings may be conveniently divided into the following classes: cylinders, cylinder heads; pistons; crank cases and transmission cases; flywheels and gear blanks; miscellaneous small castings, such as manifolds, pumps, covers, etc., and piston rings.

In making the above divisions, due consideration is made for the shop wherein questions of tonnage, melting capacity, ability to take care of special mixtures from the same cupola, price, etc., are questions of vital importance. On the other hand, a special iron will often cut down losses and be an economy in the end, in addition perhaps, to meeting the service requirements of the casting most suitably. For instance, for cylinder blocks, which are not cast integral with the upper crank case—it is desirable to have them as hard as the machining will stand. The writer's observation extending over a period of years, is that hard barreled cylinder blocks wear best in service. This statement is made on the basis of the number of cylinders returned from service for regrinding, from each year's model.

Lubrication A Factor

In the writer's experience, cylinders of a proper hardness and composition will run from 30,000 miles to better than 50,000 miles in some cases before needing to be reground. Of course, there are several factors in motor operation which govern the wearing qualities of the barrels, notably, lubrication and the richness of the explosive mixture. Cylinders cast integral with the crank case and crank cases themselves usually require a softer and tougher iron, due to the thin walls and large area to be covered and liability to cracks.

Piston rings are a specialty in themselves, and pistons are better made from special mixtures. Flywheels and gear blanks could well be made in the miscellaneous class, but for the fact that where teeth are cut in them a harder iron wears better. Cylinder iron is usually satisfactory for these castings.

For a detailed method for computing mixtures allowing for losses, the effect of varying the element constituents in gray iron, etc., those familiar with the practice are referred to Dr. Moldenke's *Foundry Practice* and to such articles as Dr. John J. Porter's "Constitution of Cast Iron" Vol. XIX, *A. F. A. Transactions*. A few words along this line, however, may not be amiss. For the foundry making the forementioned classes of castings, a fair assortment of pig iron in the yard is quite desirable, if not necessary. This stock may preferably include, first a grade of foundry iron best adapted to the general run of work in the shop; second a silvery iron, 7 to 10 per cent silicon; malleable bessemer; perhaps charcoal iron for special purposes, and selected scrap and scrap steel.

For such work as cylinders, the writer has found that in using scrap steel better results are obtained in the use of steel of fairly good section, such as rails, medium forgings or heavy boiler plate clippings. Drop forge flashings are cheaper but light and oxidize more readily. Where more than one mixture is used in a shop it is necessary to use care in keeping the remelt separated, if castings of uniform analysis are to be obtained. Under these conditions it is possible easily to vary and control the silicon, manganese, phosphorus and sulphur contents. Silicon is controlled by varying the amount of silvery iron and scrap steel used, manganese by the use of the ferroalloy or spiegel; phosphorus, in amount of steel used and perhaps by using some high phosphorus pig if it is necessary to raise its percentage; sulphur can to a lesser extent be controlled through the manganese content and by the temperature of melting and slag apportionment.

The carbon content is much more difficult to control, for the iron will take up carbon to the saturation point, depending on the temperature and silicon content, a mixture with a high silicon content, that is 2.75 to 3.00 per cent, and fairly high sulphur tends to reduce the total carbon. Moreover, melting lower than the correct level above the tuyeres in the cupola has the same tendency. Higher melting has the opposite effect. Then with a full understanding of the relations of each element and its function, together with close melting control, it is not difficult to run an iron mixture from day to day with a small variation in composition. Of course, it is understood accurate information is at hand concerning composition of all the raw materials affecting the final product and frequent analyses, observations, and sometimes physical tests are necessary adjuncts to close control and getting the most desirable results.

From a paper presented at the Cleveland convention of the American Foundrymen's association, April 28-May 3. The author is connected with the Cadillac Motor Car Co., Detroit.

Referring to the tabulated data that is shown in the accompanying table, it is to be noted that the information shown is representative of the practice of the largest corporation foundries in this country, making castings for cars from among the cheapest makes to the most expensive. Where a range of figures were submitted, the writer has averaged them and used the average figure in the table. For instance, where a silicon content is reported as from 2.05 to 2.15 per cent the value used is 2.10 per cent. Similiarly in the columns under tensile strength, hardness, etc.

An analyses of the column showing the percentage of pig iron used in the mixture, a range from 34.3 to 56 per cent is found, with an average of 44.1 per cent. The experience of the writer has been that it is not advisable to run a mixture with less than 40 per cent pig iron for cylinder work. The proportion of steel scrap and remelt to be used depends upon conditions, such as the amount of remelt available in your own shop and from the rejections from your buyers, also on market conditions. It is easier to buy uniform steel scrap than uniform gray iron scrap.

Carbon Content Important

Again referring to the tabulated data it is found that the percentage of remelt, scrap, sprues, gates, etc., varies from 25 to 45.7 per cent with an average of 38.5 per cent, and the scrap steel content from 10 to 25 per cent, averaging 16.8 per cent. The advantages and disadvantages, if any, in the addition of scrap steel to a mixture have been so widely talked of that it is unnecessary to discuss them here. Steel is a handy tool for the formulator of the mixtures, as previously pointed out, and in the writer's experience, under proper melting conditions there is little to be said against its use. For this class of work, however, most of the desired results can be obtained with the use of from 15 to 20 per cent.

Considering the use of steel scrap in the cupola from the purely physical benefits to be derived, the prime object in its use is the closing up of the grain of the iron. In so far that higher percentages reduce the total carbon content of the spout metal, in the opinion of the writer, this is extremely doubtful. Much more control of the total carbon is to be found in varying the silicon content and in the height of the melting zone of the cupola. That height of melting zone in the cupola which gives the hottest iron will also give the highest total carbon for a given mixture and raising the percentage of steel will reduce the carbon but slightly. Lowering the melting zone will result in the lowering of the temperature of the metal and will also reduce the carbon. A glance at the columns under total carbon, and under per cent of steel, shows us that the steel has little influence on the carbon. In No. 1, with 15 per cent steel, a total carbon content of 3.20 per cent is found, whereas in No. 2, with 25 per cent steel, the total content is 0.35 per cent higher or 3.55 per cent. No. 11 shows the lowest total carbon, coincident with the highest silicon and sulphur contents, and its steel ratio is lower than No. 2. The following equation taken from the "Constitution of Gray Iron," by J. J. Porter, *A. F. A., Transaction* Vol. XIX, gives a fair idea of the effect of the other elements on the total carbon. Per cent total carbon equals 4.23—0.27 x per cent silicon—0.32 x per cent phosphorus—0.3 x per cent sulphur plus 0.03 x per cent manganese.

He further adds that:

"The sum of the graphite and combined carbon is dependent upon the conditions of melting in the blast furnace and in the cupola; and upon the percentage of silicon, sulphur and manganese . . . . ."

For comparison, the writer has put in the accompanying table the specifications of the British Engineering Standards association for water-cooled air craft engine cylinders. To the writer's knowledge, neither the Society of Automotive Engineers northe American Society for Testing Materials have any specifications for automotive castings which could be used for comparison. It is to be noted that the graphite is held fairly low in both sets of figures, the silicon is lower, the manganese higher, and the phosphorus much higher, than the average American practice.

Hardness Essential in Cylinder

As previously stated, the writer's experience shows that cylinders with hard bores give better wearing composition, and the grain size is a variable with the rate of cooling. That part of the bore of a cylinder which is surrounded by the water jacket is usually the softest part of the casting, and is softer than a test bar, up to 1-inch section, which is poured from the same ladle, due to the different cooling effects. The barrel of the average automotive cylinder is seldom over one-half inch in thickness as cast. The sand of the water jacket core and of the heavy barrel core hold the heat so long that an annealing action is obtained in this portion of the barrel. This can be prevented to some degree, by the use of hollow steel of iron arbors for the barrel cores covered with only a thin layer, from 3/16 to 5/16 inch of sand, and allowing a free circulation of air beneath the bottom board through the arbors and through the cope if the cylinder is molded on end. This procedure will raise the hardness of the barrels about 30 to 40 points on the Brinell scale. Furthermore, low total carbon is desirable. That is, a cylinder from an iron containing 0.50 to 0.60 per cent combined carbon and about 2.50 to 2.75 per cent graphitic is preferable to one with some percentage of combined carbon and 3.00 per cent or over graphitic.

Silicon About 2.10 Per Cent

A further study of the questionnaire shows a silicon range from 1.75 to 2.85 per cent with the greater number using 2.10 per cent. All points considered, for the average run of cylinder work this is a satisfactory content to use. Used in conjunction with low phosphorus, it has one disadvantage in that it is provocative of more shrinkage cavities than such a mixture as No. 11. However, if the total carbon is on the low side, the iron sets quickly enough in all sections to overcome this to some extent.

The manganese content, as shown in the table, is remarkably uniform, ranging from 0.50 to 0.80 per cent. Generally speaking, it would seem a slight excess of manganese over the theoretical amount necessary to take care of any ill effects from the sulphur is all that is necessary, although it, perhaps, has some benefits as a deoxidizer.

The phosphorus ranges from 0.15 to 0.55 per cent with the predominating tendency toward the lower end of the range. This practice of using low phosphorus has increased extensively in the last few years, and is due to the fact that the cylinder manufacturer seeks to eliminate the segregation of the fluid phospho-carbides. In doing this, with a low silicon mixture, much of the fluidity of the iron is sacrificed, thereby necessitating hotter melting, which means higher total carbon. The factor of strength does not enter into consideration in this class of work, and the irons with higher phosphorus contents are plenty strong, indeed, they will average up well with the lower phosphorus irons.

For obtaining cylinder bores with a high degree of hardness, there is much to be said in favor of the high phosphorus mixtures such as are typified by the examples shown above of the British Engineering Standards association, and discussed by Mr. Cook in his paper at the last convention of the American Foundrymen's association. These irons hold their hardness through the cooling range, due probably to the predominating phosphide constituent; and the total carbon content is usually considerably lower than low phosphorus irons of the same silicon content. Unfortunately, in the experience of the writer, with the pig irons obtainable in this country, segregation is a frequent and difficult prob-

lem to control when such mixtures are used on complicated castings. With castings of simple design and uniform section very good results can be had. But with low phosphorus irons, the writer's experience has been that the defects due to leaky walls is much reduced.

Sulphur About 0.095 Per Cent

The column under sulphur in the data sheet shows a range from 0.08 to 0.15 per cent with the average about 0.095 per cent. Present day practice shows an increase in the sulphur content of most grades of castings in this class of work. There are some arguments which can be set forth favorable to a higher allowable sulphur content than was formerly thought possible to use without serious detriment to the casting. Now for this class of gray iron, a predominating pearlite structure is highly desirable. The writer believes, however, that with the sulphur at such percentage the silicon should be increased somewhat. The writer knows of one cylinder foundry which has been using a mixture wherein the silicon averages about 3.0 per cent, the sulphur 0.15 per cent and the phosphorus under 0.20 per cent, for several years with good results.

For a serviceable mixture, all points considered, the writer believes the following mixture unusually satisfactory to aim at: Silicon 1.80 to 2.10 per cent; manganese, 0.50 to 0.80 per cent; phosphorus, 0.15 to 0.20 per cent; sulphur, 0.08 to 0.12 per cent; combined carbon, 0.50 to 0.60 per cent; and graphitic carbon 2.50 to 2.75 per cent. Such a casting should machine satisfactorily, give a good close grain, and wear well in service.

By machining satisfactorily is meant that a cylinder block cast from this mixture can be milled with a cutting speed of from 60 to 80 feet per minute, with a cutting depth of ⅛ inch; and bored with a cutting speed of 45 to 50 feet per minute with a ⅛-inch cut.

Furthermore, such an iron will have a transverse breaking strength above 3500 pounds on the arbitration bar and a tensile strength of over 30,000 pounds. These figures are conservative and taken from actual results in the practice of the writer with iron of the above analysis, save that the total carbons were higher, about 3.50 per cent. The difficulty in obtaining such iron is in getting the total carbon down to the figures indicated.

Regarding fuel ratio, a variation is found from 1:5 to 1:92 with an average of 1:7.33, which is a good ratio considering the steel ratios, and that this class of work is fairly light and needs to be melted fairly hot. Coke used on bed is not included in the figures given for ratios.

Tuyere Ratios Diverge Greatly

Under the column on tuyeres ratios is found a great divergence in practice with ratios varying from 1:2.25 to 1:10.9. With the exception of Nos. 5 and 10, they are all lower, under 1:6, averaging 1:4.73. Some authorities give 1:7 as the proper proportion, whereas others say about 1:4. Judging from data submitted, there is nothing to be taken as a standard. A comparison of the tuyere ratios to the fuel ratios does not add any light on the subject for No. 8, with a tuyere ratio of 1:2.25 and a fuel ratio of 1:7.7 is little different in fuel consumption than No. 9 with a tuyere ratio of 1:8. It hardly seems possible that there should not be a ratio between the area of the tuyeres and the area of the cupola which gives the best melting conditions. There still is need for data on cupola design.

Piston Data Also Compiled

Some of the replies gave no data on pistons. It is to be noted that among those using special iron for pistons, that the silicon content is higher, running from 2.35 to 2.75 per cent, the manganese content about the same as for cylinders, likewise the phosphorus and sulphur; the combined carbon lower, averaging about 0.35 per cent as against 0.47 per cent for cylinders. The total manganese content about the same as for cylinders. The per cent of pig iron used is a little higher, averaging a little better than 45 per cent, but the percentage of steel is lower, averaging about 11 per cent only. The average percentage of remelt is thereby raised a little, averaging about 44 per cent. These figures would be changed but little, even if the mixtures as indicated for cylinders were included. The drop in strength is quite noticeable which is to be expected from the difference in analysis.

Present day practice is to make pistons as light as possible, and extensively with green sand cores. They can be cast with wall thickness as low as 3/32 of an inch. With such light sections, however, there is a severe tendency to get chilled spots when using mixtures with low phosphorus. The wrist pin bosses are heavy and there is usually trouble in preventing shrinkage cavities between these bosses and the wall of the piston. A higher silicon content, say from 2.50 to 2.75 per cent, is desirable, for it serves several purposes, counteracting the shrinkage above mentioned, minimizes the blows, and counteracts the

Data Gathered on Mixtures Used for Cylinder Castings

No.	Silicon, per cent	Manganese, per cent	Phosphorus, per cent	Sulphur, per cent	Combined carbon, per cent	Graphitic carbon, per cent	Total carbon, per cent	Pig iron, per cent	Remelt, per cent	Steel, per cent	Fuel ratio	Tuyere ratio	Blast pressure, ounces	Diameter of cupola inside lining, inches	Tensile strength, pounds per square inch	Transverse break, 1¼-inch diameter arbitration bar, 12-inch centers	Deflection, inches	Brinell hardness
1	2.10	0.80	0.20	0.08	0.50	2.70	3.20	40	45	45	1:7.27	1:5.9	12	54	.....	.....	...	...
2	2.50	0.60	0.55	0.15	0.45	3.10	3.55	35	40	25	1:5	1:5	15	72	40000	3100	0.18	185
3	2.25	0.65	0.20	0.10	0.40	3.00	3.40	34.3	45.7	20	1:7	1:5	18	78	30000	3000	0.15	201
4	2.20	0.65	0.30	0.09	0.20	3.30	3.50	45	45	10	1:8.3	.....	11	60	34000	3800	0.17	...
5	2.40	0.60	0.22	0.10	0.35	3.00	3.35	43.4	40.6	16	1:6.6	1:10.9	13	66	.....	3000	0.14	181
6	2.20	0.65	0.45	0.09	0.50	2.90	3.40	50	37.5	12.5	1:6.8	1:4.7	16	60	33000	3300	0.12	217
7	1.75	0.55	0.25	0.08	...	...	...	50	30	20	1:8.3	1:5.5	13	54	33500	3350	0.16	207
8	2.10	0.60	0.22	0.095	0.60	2.80	3.40	55	25	20	1:7.7	1:2.25	14	60	27400	3800	0.135	197
9	2.25	0.60	0.25	0.10	0.45	2.80	3.25	48.9	39.1	12	1:8.5	1:8.0	14	54	37500	3100	0.14	192
10	2.10	0.60	0.20	0.095	0.60	...	...	56.0	32	12	1:9.2	.....	16	64	.....	.....	...	190
11	2.85	0.50	0.18	0.15	0.50	2.40	2.90	42	40	18	1:7.4	1:3.75	11	48	37500	3750	0.16	175
12	1.90	0.70	0.18	0.08	0.50	2.90	3.40	38	44	18	1:6.66	1:5.4	14	54	30400	4300	0.13	170
13	2.00	0.65	0.20	0.095	0.50	3.20	3.70	40	44	16	1:8.5	1:6.1	16	70	.....	.....	...	175
14	2.50	0.70	0.25	0.09	0.40	...	...	53.5	34	12.5	1:7.5	1:4.1	..	52	.....	.....	...	...
15	2.70	0.55	0.20	0.10	0.50	2.70	3.20	40	37.5	22.5	1:5.9	1:4.25	11	54	32500	3300	0.125	200
16	2.05	0.60	0.15	0.09	0.60	2.80	3.40	43.3	36.6	20	1:6.66	1:4.8	..	72	36000	4400	0.25	212
*	1.20	0.80	0.35—	0.12	0.50—	...	2.70—	...	...	...	.....	.....	..	..	.....	.....	...	...
A	1.80	Max.	0.80	Max.	0.80	...	3.50	...	...	...	.....	.....	..	..	.....	.....	...	...
*	1.20	1.10	0.60—	0.12	0.50—	...	2.70—	...	...	...	.....	.....	..	..	.....	.....	...	...
B	1.80	Max.	1.20	Max.	0.80	...	3.30	...	...	...	.....	.....	..	..	.....	.....	...	...

*The British Engineering Standards association specifications for water-cooled aircraft cylinders. *Foundry*, Vol. L-3, Feb. 1, 1922

chilling tendency of the quick setting iron. Hot melting is essential for the metal should come from the spout better than 2600 degrees. Another trouble of considerable importance with such light castings is the loss due to cracks. Many machine shops use air expanding chucks holding the piston from the inside and causing considerable strain on the casting. It is well to toughen the iron by the use of a fair percentage of charcoal iron in the mixture, say about 20 per cent. For this purpose the writer has used the Lake Superior charcoal brands to good advantage. For especially high grade pistons, where expense is not of prime importance, from 4 to 5 per cent nickel may be used to advantage, giving a product when machined of beautiful finish, extremely fine grain, and high strength, about 37,000 to 38,000 pounds tensile strength, and uniform hardness.

On pistons, it is good practice after the rough cut in the machine shop to anneal sufficiently to remove casting strains. This to a large extent, prevents the casting from going out of round on the final operations.

Miscellaneous Small Castings

An analysis of the data on small castings reveals a range from a low silicon, hard iron in No. 3, to soft, rather high silicon irons such as Nos. 12 or 15, with the latter in a predominating majority. No. 3 stands out really as an exception to the usual run of irons for this class of work. It is interesting to note here, as a further instance of the effect of steel on the total carbon, a comparison with No. 8. Both contain approximately the same amount of steel in the formula, but a noticeable difference in the carbon percentages. No. 3 is melted in a 36-inch cupola with 2200 pounds of coke on the bed. The fuel ratios are not very different, No. 3 being 1 to 6.6 and No. 8 being 1 to 7.6. It would seem that No. 3 is melted lower than No. 8, which accounts to some extent for the difference in the carbon. As a rule, castings in this class are not as complicated and variable in section as are cylinders and crankcases, and strength is not of primary importance. They can, therefore, stand being made softer and from a more fluid iron, with machining qualities given much more consideration. As said before, where possible, it is well to use the iron that gives the best results to the work at hand, and the composition and proportionment of the pig iron, remelt and steel is largely a matter of experience and judgment.

It is of interest to note that in No. 3 only 25 per cent of pig iron is used, which is the minimum in all the mixtures submitted. Frequently the ailments of defective castings are attributed to lack of sufficient pig iron in the mixture, but the writer is familiar with the foundry using this mixture, and the class of work turned out, and believes if it were not of proven value, it would not be submitted in the questionnaire. The experience of the writer, has been that defects such as shrinks and draws have afterwards been remedied by raising the percentage of pig iron when using less than 40 per cent pig iron, even though the analyses may be nearly identical in the two instances. For this class of work, the writer has used for a number of years, a mixture of about the following composition:

	Per cent
Silicon	2.40-2.60
Manganese	0.50-0.70
Phosphorus	0.25-0.35
Sulphur	0.06-0.08
Combined carbon	0.30-0.40
Graphitic carbon	3.10-3.30
Pig iron	about 40
Remelt	about 50-52
Steel	about 8-10

There is little to comment on in the data on crankcases. Most of the foundries use either the cylinder iron or the softer iron used for small castings. None use special iron for flywheels, but in most cases, use cylinder mixtures, especially where teeth are cut in the rim of the flywheels. The cupola practice is practically in every case a facsimile of that shown with the data collected on cylinders.

To show the interest which some of the foundries manifested in data requested on the questionnaire, one large automobile corporation foundry submitted the ideal mixtures as viewed by their metallurgist, foundry superintendent and assistant foundry superintendent. This data is all available for use should the association desire to appoint a committee to draft recommendations for the different classes of this work to serve the automotive engineer and manufacturer as a guide in writing specifications.

Electrochemistry Shows Advance Abroad

(*Concluded from Page* 1454)

This plant also turns out a pure grade of pig iron made in an open type electric furnace, with phosphorus of 0.021 per cent, sulphur 0.005 per cent and copper 0.018 per cent; ferrosilicon of 25, 50 and 75 and 90 per cent silicon; 60 per cent ferrochrome; 80 per cent ferromanganese; 18 per cent ferrophosphorus, and cadmium of 99.5 per cent purity, obtained from the zinc shavings used in purifying the zinc sulphate solution in connection with the production of electrolytic zinc. Calcium carbide is being manufactured in fair quantities at present; the extensive fishing industries make considerable use of acetylene torches in night fishing and absorb an appreciable portion of this product.

China, in spite of her 400,000,000 people and most ancient of civilization, at the present time offers but little if any opportunity to the electrochemist. Although both rich coal and iron deposits exist and fairly modern blast furnaces and steel plants are available for turning out pig iron and finished shapes and rails, there has been practically no electric furnace development, and electrochemistry, except as applied in a few small plating shops and possibly in the new mint in Shanghai, is not known. There is but little waterpower available or developed throughout the vast alluvial plain forming the eastern-central part, or Great Middle Kingdom of China. In one or two of the more important coast cities electric furnaces have begun to be used in the foundries and shops of the larger companies. At Hongkong, in a steel foundry, a 2-ton furnace of one of the better-known makes has given an excellent account of itself, although hand regulation of electrodes by Chinese labor melting from cold scrap has caused considerable conversation between the central station and foundry managers, with instructions from the former to the latter to keep off the line during peak hours.

Summarizing the possibilities for electrochemical activity in South American and Far Eastern countries, it would seem that general immediate progress will be made in Japan, the west coast of South America and Brazil. There will be perhaps more general research work done in Japan than elsewhere, although naturally the large companies operating on the west coast of South America will continue research along the lines pertaining to their particular operations. Certain countries with ample power but relatively few minerals, such as Japan, are suited especially to the conversion of the raw products of their neighbors into finished materials of world-wide application.

Platinum Output Lower

Although production of crude platinum in 1922 was less than that of 1921, the output compares well as unfavorable water conditions prevailed throughout most of 1922 in the Klamath mountains of northern California and southwestern Oregon. A total of 928 troy ounces of crude platinum and osmiridium, valued at $101,000 was produced in 1922 as compared with the 977 troy ounce output of the year preceding under more advantageous conditions.

Reviews British Foundry Practice

Growing Use of Scientific Foundry Methods Has Become an Important Factor in Foundries of Great Britain—Wide Range of Castings Produced—Casting Temperatures Are Shown To Have Decided Effect Upon Physical Properties

BY PERCY LONGMUIR

FOUR earlier papers contributed by the author to the American Foundrymen's association offer a natural starting point for the present one in which it is intended to present a review of metallurgical development in British foundry practice. The sequence of such a review ought to commence in Egypt about 2000 B. C., to follow up to the period which in Britain showed the development of the bronze age and its passing into the iron age at least a century before the first Roman invasion. The overrunning of the north of England by the Scandinavians led to a very material development of the iron industry and within a very short radius from Wortley, near Sheffield, where these notes are being written are strong evidences of early iron production. These evidences include direct production of wrought iron developing later into after treatment by rolling and the introduction of grooved rolls, the mills being driven by water.

Develop Blast Furnace Practice

Following the revival by Darby of Dudley's coking process the natural development of blast furnace practice had its corresponding effect on gray iron foundry progress and ultimately on the development of steel founding. British foundry practice today owes a considerable debt to the early effective pioneering work of Professor Turner, and his investigations of the action of silicon upon cast iron not only gave a definite impetus to foundry development but had the further valuable incentive of turning many other workers towards systematic investigation of cast metals. The comprehensive work of Hadfield, beginning with alloys of iron and manganese and continued through many other possible combinations, has led to vast extensions in the field of ferrous metallurgy and resulted in a consequential development of steel foundry practice.

From a paper presented at the Cleveland convention of the American Foundrymen's association, April 28-May 3. This paper is the fourth of a series on foundry problems being exchanged between the Institution of British Foundrymen and the American Foundrymen's association. The author is prominent in the British foundry industry and is located at Sheffield, Eng. He is a past president of the Institution of British Foundrymen and director of the British Cast Iron Research association.

Arnold in his classical research on the "Influence of Carbon on Iron" published in 1895, paved the way for definite studies of constitution which have since been developed and advanced by many European workers to the profit of metallurgy in general and foundry science in particular. The reports of the alloys research committee of the Institution of Mechanical Engineers, the proceedings of the Iron and Steel institute, the Institution of British Foundrymen, the Institute of Metals and many other live organizations all contain definite evidence of substantial forward movement. In addition, the universities of Britain are doing particualrly good work in advancing the outposts of the known into the unknown. In view of the extent of this work it is impossible to refer to it in detail but reference should be made to the valuable work of Desch in Sheffield and Turner in Birmingham universities.

In his 1901 paper before this association, "The Relation of the Laboratory to the Foundry," the author concluded with: "The future of all foundry work depends upon the development of scientific methods, and from the foothold these methods have already obtained we see the dawn of an era which will be distinguished by a great advance of the whole foundry industry."

The intervening 22 years have shown that the foothold then indicated has become a factor in all the more important British foundries. Undoubtedly the success of this establishment is due to the fact that it has progressed hand in hand with practice thereby resulting in the development of the latter. Chemical and metallographical laboratories have proved of high value to practice. Equally on the other hand experienced practice of the foundry floor and the melting platform have proved invaluable to the laboratories.

While this united development has taken place it can but be admitted that each forward step has simply increased the extent of the unkown. After all, this is but a natural law and the breasting of one hill just opens vistas of other hills yet to be climbed. It must be remembered that 22 years ago engineering practice was receiving more attention than foundry practice. Therefore the foundry had a certain leeway to make up. During this period of making up engineering practice has not been stationary. Therefore the foundry has not only had to make up lost time but also to make the further endeavor of overtaking present development in industries whose foundation depends upon a supply of reliable castings.

Producing Gray Cast Iron

The range of iron ores available to the blast furnaces together with the range in practice of the furnaces affords the British iron founder a wide choice of pig iron. This choice can be supplemented by varying additions of mild steel and ferroalloys and therefore a very wide range in product is possible.

The extent of the studies devoted to this product is well shown in the proceedings of the Institution of British Foundrymen. Not only is the range in composition great but equally so is the type of casting. The development of high speed internal combustion engines has created a series of exceedingly intricate castings and the author has unique opportunities of seeing how admirably the founder is meeting these difficulties. In weight alone the range is equally great; Riddell of Falkirk will successfully reproduce an ordinary tree leaf in cast iron, using the leaf as a pattern. T. Firth of the Brightside Foundry & Engineering Co., Sheffield, produces castings of a type weighing 106 gross tons.

Advantages and disadvantages of the iron melting cupola were well drawn in Mr. Elliott's exchange paper before the Institution of British Foundrymen in 1921. However, the ruling factor of cost supplemented by the fact of the general efficiency of the cupola melted products will require much consideration before the adoption of the duplex electric furnace process. As indicated by Desch in discussing this paper the natural economic avenue for the electric fur-

nace is in the direction of steel castings.

In Britain work is being carried out in the direction on the one hand of increasing cupola efficiency and on the other of studies in hearth furnaces including coal, oil and gas firing. It is in one of these directions that future economic development of melting for gray iron and alloyed cast irons will take place.

In British practice "white heart" malleable predominates over "black heart" malleable cast iron so far as quantity is concerned. A good range of white, semimottled and mottled pig irons is available. Many of the furnaces also supply refined pig irons. When an open-hearth, gas-fired furnace is the melting medium, refining of the bath is permissible. Crucible melting is still largely followed especially in the Midland area but bulk work is generally from cupola melted metal. Coal-fired reverberatory or gas-fired open-hearth furnaces are utilized and the development of the industry points to the growing use of the latter. Representative melting practice is shown in Table I.

Table I

Representative British Melting Practice

		Method of Melting			
	Charge Per cent	Crucible Per cent	Cupola Per cent	Coal-fired reverberatory Per cent	Gas-fired open-hearth Per cent
Carbon	3.5	3.4	3.4	3.2	3.2
Silicon	0.85	0.82	0.75	0.65	0.70
Manganese	0.20	0.10	0.10	0.10	0.10
Sulphur	0.25	0.30	0.31	0.27	0.26
Phosphorus	0.05	0.05	0.05	0.05	0.05

Average commercial castings give a maximum stress of from 20 to 28 tons per square inch, with elongations of from 2 to 6 per cent on 2 inches and reduction of area of from 2 to 8 per cent. Cold bending tests on ½ inch square bars range from 45 to 90 degrees. A series of commercial castings of Scottish origin tested by the author gave the following results: Silicon, 0.65; manganese, 0.15; sulphur, 0.30; and phosphorus, 0.04 per cent. The maximum stress in tons per square inch was 27, the elongation in two inches was 5.7 per cent and the reduction of area was 10 per cent.

In the field of British malleable cast iron Hadfield has done most valuable pioneering work. Reference should also be made to some promising work by Royston in 1897. Royston's early work apparently lay in the direction of an endeavor to obtain quick if not instantaneous decomposition of the hard carbides and thereby shorten the annealing time. Today this idea is well worth investigation along the lines of determining critical ranges in the near vicinity of the solidification range. A certain amount has been done in the way of laboratory experimental work and in 1904 the author obtained this quick decomposition and resultant precipitation of temper carbon by heating to temperatures near the fusion range. However, investigation on practical lines is required in which limiting foundry conditions, influence of mass, change in section and contour of casting and resultant possibilities are included.

In view of the masterly paper of Professor Touceda previously referred to, the present author feels much diffidence in dealing with malleable cast iron. However, it cannot be denied that British malleable iron practice offers a most promising field for research. In this respect the author can only re-echo and appreciate Professor Touceda's sentiments of cooperation between the two countries.

In closing this note on malleable cast iron it is permissible to refer to a casting recently selected at random in a British foundry. Ductility under a striking hammer was so evident that analyses and metallographical examinatons were made. The analysis showed total carbon, 0.03; graphitic carbon, nil; silicon, 0.52; manganese, 0.17; sulphur, 0.292; and phosphorus, 0.049 per cent. Microscopical examination showed the structure to be built up mainly of ferrite with involved iron and manganese sulphides.

Steel Casting Practice Improves

Systematic steel casting in foundries began in Britain about 1856 and Vickers was one of the first successful workers in this direction. He was followed by many workers among whom may be mentioned Attwood Rogerson, Spencer and Orborn. The Paris Exhibition of 1878 apparently gave an impetus to steel founding in the exhibit of the Terre Noire Co. Early developments were necessarily of the trial order and naturally many errors had to be eliminated. In this patient persistent work lies the foundation of the steel casting industry of today. This early practical work followed by the researches of Hadfield, Stead, Arnold, McWilliam and many other workers not only opened up scientific possibilities but further led to united practical and scientific attack on the problem of steel casting.

In today's commercial practice crucible melting is followed to a limited extent only. The bulk of the castings are produced from acid and basic open-hearth furnaces, bottom or surface blown convertors. The electric furnace is gaining ground in steel foundry practice and by virtue of its elasticity offers an excellent medium for the production of special and alloy steel castings.

Generally speaking the metallurgy of steel castings has as its first concern the determination of the most suitable composition to meet the required mechanical properties. Secondly the process whether open-hearth, surface blown or electric, should finish with a bath of "killed," that is, dead melted steel. This is achieved by judicious conduct of process and judicious use of deoxidizers. In regard to process it is possible to produce high purity with little or no addition. The following pure iron casting, analyzing carbon 0.04; silicon 0.02; manganese 0.07; sulphur 0.02; and phosphorus 0.02 per cent, was crucible melted and killed with a trace of aluminum. As cast the metal showed a yield point of 10.7 tons per square inch, a maximum stress of 19.8 tons per square inch, an elongation of 30 per cent in 2 inches, and a reduction in area of 39 per cent. Annealed the metal showed a yield point of 9.1 tons per square inch, a maximum stress of 19.2 tons per square inch, an elongation of 46 per cent in 2 inches, and a reduction in area of 65 per cent.

Purity of this type is hardly commercial but at the same time the results give the properties of pure iron in the cast and treated condition. Additions of carbon to such an iron would progressively stiffen

Table II

Special Elements Affect Steel Castings

Nickel Steels in the Cast Condition Reheated to and Cooled from 800 Degrees Cent.

Contents of			Yield point, loss per square inch	Maximum stress, tons per square inch	Elongation in 1.75 inches, per cent	Reduction in area, per cent
Nickel, per cent	Carbon, per cent	Manganese, per cent				
Nil	0.47	0.95	19.24	38.49	15.42	16.26
1.20	0.48	0.79	22.07	43.23	14.28	14.88
2.15	0.47	0.86	25.79	42.84	17.70	23.51
4.25	0.40	0.82	28.11	43.49	13.10	17.94
4.95	0.42	1.03	36.00	56.09	14.28	24.43
6.42	0.52	0.92	37.13	57.51	6.20	8.42
7.95	0.43	0.79	41.47	74.03	4.50	5.68
12.22	0.41	0.85	39.85	71.19	6.20	6.88
15.98	0.45	0.83	31.59	76.55	4.00	4.21
19.91	0.41	0.96	17.94	29.69	14.30	19.05

it but experience has shown that carbon alone is not sufficient at any rate so far as castings are concerned. For this reason the two most familiar deoxidizers, silicon and manganese, are either singly or combined added to leave a predetermined excess in the finished steel.

A steel casting containing carbon 0.34; silicon 0.15; manganese 1.58; sulphur 0.06; and phosphorus 0.06 per cent gave the following values: As cast, a yield point of 23.1 tons per square inch, a maximum stress of 35.8 tons per square inch, an elongation of 8 per cent in 2 inches, a reduction in area of 9 per cent, and a bending angle of 33 degrees. Annealed the same casting showed a yield point of 17.3 tons per square inch, a maximum stress of 32.1 tons per square inch, an elongation of 21 per cent in 2 inches, a reduction in area of 28 per cent, and a bending angle of 180 degrees.

The influence of special elements is naturally a very large field and the results of Table II are given as representing only a small section of this field.

Characteristics Common To All

There are many features common to all grades of castings. Liquid shrinkage, solid contraction and its resultant warping are familiar to all founders and vary in intensity according to the type of metal or alloy handled. At the moment it is impossible to touch on these interesting features but there is one common characteristic on which the author would like to dwell briefly. This is the influence of varying casting temperature on the physical properties of cast metals and alloys. Some years ago hard practical experience in the production of high pressure fittings led to the recognition that for a given metal or alloy, one range of pouring temperature would produce a pressure tight casting while another pouring temperature from the same ladle would result in a porous casting.

Gray cast iron having an analysis of combined carbon 0.52, graphitic carbon 3.4, silicon 1.78, manganese 0.28, sulphur 0.04, and phosphorus 0.27 per cent showed a maximum stress of 9.7 tons per square inch at a casting temperature of 1400 degrees Cent. a stress of 14.1 tons at a casting temperature of 1350 degrees, and a stress of 10.6 tons at a casting temperature of 1245 degrees.

For malleable cast iron the results were as follows:

Casting temperature degrees Cent.	As cast, maximum stress, tons per square inch	Annealed, maximum stress, tons per square inch	Heated to 1000 degrees Cent., slowly cooled, maximum stress, tons per square inch
1320	10.7	20.6	18.6
1230	15.9	29.2	24.0
1120	12.1	26.5	21.6

Annealed steel castings having an analysis of carbon 0.29, silicon 0.07, manganese 0.16, sulphur 0.07 and phosphorus 0.06 per cent showed the following results:

Casting temperature	Maximum stress tons per square inch	Elongation in 2 inches, per cent
High	24.2	9.5
Fair	27.2	24.0
Medium	27.0	12.5
Low	25.5	8.0

The foregoing results are selected from a large series and in each instance represent the contents of one crucible or one ladle. The method being to superheat the metal or alloy and pour one set of bars at the "high" heat; the crucible then being allowed to stand until the temperature had fallen to the "fair" heat and then pour the second set. The third set or "low" heat represent the lowest safe pouring temperature. The physical results given show within the contents of one crucible a wide range of properties due to casting temperature alone. An equally wide range is found if a series of valve bodies are cast from one crucible very hot at intervals down to as low as fluidity is possible. The castings corresponding to the "fair" heat will be tight to internal pressure while on either side of the "fair" zone there will be porosity.

Although many actual casting temperatures have been determined only comparatively few have been quoted in terms of degrees Cent. This for the reason that there cannot possibly be a constant "fair" casting temperature for any given alloy to cover every type of casting made in that alloy. Correct casting temperature must necessarily vary with the contour and section of the castings and it is in this direction where trained foundry judgment can exercise its skill to the advantage of the product.

Study Refractory Sizes

At the request of the American Foundrymen's association, the division of simplified practice of the department of commerce will call a meeting in Washington on May 21 to consider simplification and standardization of sizes of refractories. The conference probably will result in the creation of a special committee, on which foundrymen and refractory makers will be represented, to make a preliminary survey. Invitations are to be issued this week to interests proposed by the association.

Simplification Advancing

Simplification and standardization of American industries is progressing rapidly, according to a report of the survey of the last 12 months developed by the fabricated production department of the Chamber of Commerce of the United States. The report states in part that automobile tire makers reported having invested "$7,000,000 in simplification;" pipe and fitting concerns have reduced active lines with "increased production at lower cost from each of our mills;" the shoe industry was enabled "to make more shoes per operator at a lower cost than we even anticipated;" makers of rubber products have cut 145 articles to 29 "and do a larger business"; farm implements simplification meeting "ramifications that are likely to prove almost revolutionary" with advantages to distributors as well as manufacturers, store fixture business "grown twenty fold since we adopted simplification," and many other examples of the importance of simplification proceedings.

Railroad Begins Program of Electrification

To increase its traffic capacity and to secure important operating economies, the Virginian railway will electrify 213 miles of its track lying between Roanoke, Va., and Mullens, W. Va. The project will involve an expenditure of $15,000,000. The order for the electric locomotives, powerhouse, transformer stations and other apparatus has been placed with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and is said to be the largest railroad electrification contract ever placed. The division to be electrified crosses the Allegheny mountains. The alternating-current single phase system will be used.

The largest steam locomotives now in use on the Virginian railway are of the articulated Mallet type, with 20 driving wheels and four cylinders. Three of these engines are used to move 5500-ton trains over the grades, but their combined power does not exceed 7000 horsepower and their speed on the grades is only 7 miles per hour. The new electric locomotives will develop 20,000 horsepower per train and will haul 9000-ton trains up the grades at the rate of 14 miles per hour. A feature of the locomotives will be the use of regenerative braking on the down grades. This method will not only reduce the wear on the brake-shoes and wheels but will also save 15,000,000 kilowatt-hours of electrical energy per year.

Power for operation will be supplied by a 90,000-horsepower generating plant to be erected on the New river. This will supply 88,000-volt current to the main transmission line. For use of the trolley wires this voltage will be stepped down to 11,000 volts by transformer stations placed at regular intervals along the line. On the locomotives this is reduced to a low value for the operation of the motors.

Change Electric Furnace Design

New Construction Departing from Usual Arrangement of Electrodes Gives Greater Flexibility of Operation—Steelmaking Furnace Now Being Built and Having 60 to 80-ton Capacity Is Provided with Eight Electrodes

BY FRANK HODSON

IN SPEAKING of large electric furnaces, the term must be understood to mean the size as compared to the average existing electric furnace. What was considered a large open-hearth furnace 10 years ago might well be classed as small today, and in the same way what now is considered a large electric furnace may be small a few years hence.

One of the reasons hitherto against the development of large electric furnaces has been that the older system of three-top electrodes does not, for good electrical and metallurgical reasons, lend itself to multiples of three electrodes. Thus the size of such a furnace is limited by the current-carrying capacity of the three largest commercial sized electrodes that can be bought and used in steel furnaces. This limit has just about been reached at 40 tons of hot metal and three 24-inch electrodes.

Mechanically, there is no reason for electric furnaces not being built just as large as open-hearth furnaces, and if we remove this three-electrode limitation in size, we open up a new field of design and utility for the large electric furnace.

The size of a finishing electric furnace for tool steels is restricted somewhat by the necessity of casting small ingots, as compared to gun or armor ingots, and by the need for accurate control of pouring temperatures. This condition, however, does not apply to furnaces for cheaper grades of steel or for furnaces used as an intermediate process, say between the blast furnace and the finishing furnaces. Provided power can be obtained at a reasonable rate, electric furnaces of large capacity can be employed usefully and economically as a feeder to smaller finishing furnaces.

Tendency Toward Larger Furnaces

The modern metallurgical tendency is toward increased size of melting furnace. This is noticeable, particularly in recent open-hearth plants and it is recognized generally that handling large quantities of metal is much more economical than small since refining is quicker, the metal is more homogeneous and heat losses are less.

The furnace as finally developed may be described as an arc-resistance furnace which on normal operation introduces two phases of the 3-phase power supply line through two or more top electrodes and the third phase through the whole of the furnace hearth. On all recently installed Greaves-Etchells type furnaces with four or more electrodes, the system and design permit of the whole of the power being put through top electrodes or by change of position of an oil switch through top electrodes and the furnace hearth, a balanced load being obtained with either method. This arrangement gives the furnace considerable flexibility of operation, as top electrodes and high voltage can be used when melting down or when starting up a cold furnace, and the top and bottom contacts when molten bath is obtained or for refining and superheating.

The general arrangement of this furnace is shown in Fig. 1, right, in which *D* and *E* are the electrodes and *H* is a

From a paper presented at the Pittsburgh convention of the American Institute of Electrical Engineers, April 24-26. The author is president, Electric Furnace Construction Co., Philadelphia.

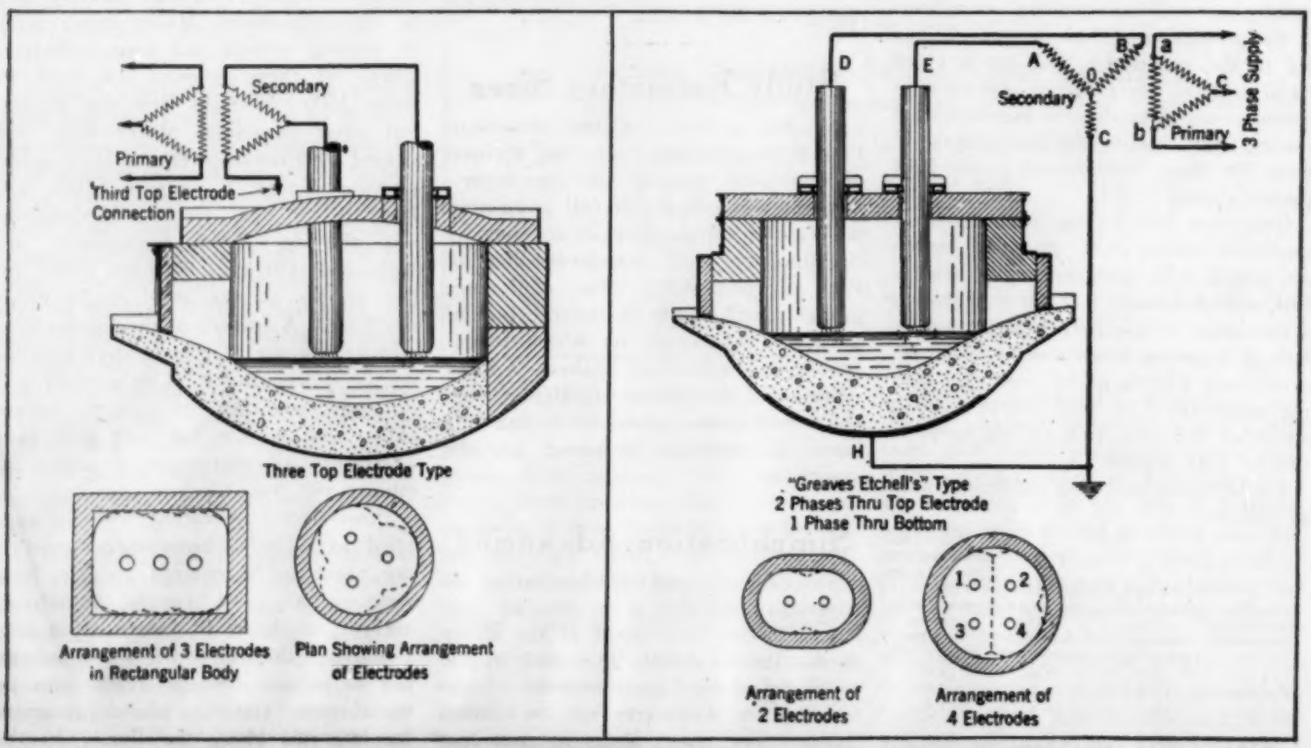


FIG. 1—(LEFT) DIAGRAM SHOWING ARRANGEMENT OF ELECTRODES AND TRANSFORMER CONNECTIONS IN THE THREE TOP ELECTRODE TYPE OF FURNACE. (RIGHT) ELECTRODES AND TRANSFORMER CONNECTIONS IN GREAVES-ETCHELLS TYPE FURNACE

sheet of copper beneath the lining of the hearth. The three terminals, *D*, *E* and *H* are connected to the legs, *A*, *B* and *C* of a star-connected transformer system, the primary windings being in delta. If the electrical resistance of the hearth were equal to the resistance of each of the electric arcs, the terminals *D*, *E* and *H* could be supplied from an ordinary 3-phase source of supply, the voltages between *D* and *E*, *E* and *H*, *H* and *D*, would all be equal and the molten metal *F* would be the neutral point of this system. However, as the hearth resistance in practice is decidedly less than the resistance of an arc, an ordinary 3-phase supply cannot be used, and in order to obtain a balanced load on the supply lines the secondary winding, *OC*, must have a smaller voltage than *AO* or *OB*.

Electrodes Are Not Limited

It will be seen from diagrams that the Greaves-Etchells type furnace is not limited in size or in number of electrodes, as each group of two or four, with or without hearth connection, constitute electrically a separate furnace unit, and any multiples of two or four electrodes are quite feasible. The 60 to 80-ton furnace under construction for the Ford Motor Co. River Rouge plant, Detroit, has four banks of transformers each of 3000 kilovolt-amperes. These are just as satisfactory and safe as four separate furnaces would be, and the power input will be introduced so that a stoppage of one, two, three or even four electrodes will not necessarily mean a furnace shut down. Each electrode will operate independently, so the stoppage of the arc on one electrode will not break the other arcs.

The advent of the Soderberg continuous electrode, now operating on a number of electric steel furnaces, also may have considerable bearing on future design of large electric furnaces. For the benefit of readers not acquainted with this device, it may be desirable to say that it consists of a thin metallic casing the size of the electrode to be used, into which the electrode paste or mix is dropped. This can be made up either over the furnace, or as is done now on most steel melting furnaces fitted with the Soderberg, by jointing up outside the furnace from 12 to 18 feet of casing, filling with the mix and putting into existing electrode holders, the actual baking of the electrode being done in the furnace. The cost is the mix, plus the thin metallic casing, against finished extruded baked electrodes. Actual electrode consumption is considerably less, as the electrodes are protected by the metallic casing and there are no broken electrodes, butt ends, etc. The significant point, however, is that the size of this electrode is not limited by the size of the largest extruding press and electrodes either solid or hollow can be built far larger than called for in any existing furnace. By use of such an electrode, the design of holding capacity of the large three-top-electrode furnace can be more than doubled, although it still would have some of the inherent electrical and metallurgical defects of such furnaces.

Fig 3 shows a diagrammatic plan and elevation of the 60 to 80-ton furnace designed for the Ford Motor Co., River Rouge plant, Detroit, and now under construction. It will be equipped with eight electrodes and transformers of 12,000 kilovolt-ampere capacity. The electrodes are arranged in two rows of four, and each pair and contact plate under the hearth of the furnace, which is common to all, forms an electrical unit and is supplied by a 3000 kilovolt-ampere 3-phase transformer with the connections shown in Fig. 1, left. By means of a switch, power can be put entirely through the top electrodes. When this is done the bottom connections are thrown in series and consequently no current can flow through the hearth. As the additional current which would ordinarily flow through the hearth is distributed over the transformers and thence to the electrodes, the efficiency of the furnace is not altered and a balanced load still is maintained. The two diagrams illustrate the relations obtained in the primaries of the transformers when operating with top electrodes only, or with the top and bottom connected.

Built of 1-Inch Plate

The furnace has inside dimensions of 20 feet 6 inches by 16 feet, built up of 1-inch plate. Two rockers of heavy cast iron section form the main supports and these are assisted by 12-inch I-beams placed on 27-inch centers. The rockers are so placed that the two upright channel columns in the rear rest directly on the rocker bearings. The furnace has a double lining with air space between. Fig. 2 illustrates the general design and lining. The furnace is designed on open-hearth lines, has five doors, giving access to all parts of the furnace, and tilts endwise. All doors are operated by air cylinders, having a definite stroke to prevent overtravel. The side walls of the furnace are 18 inches thick and the rear wall is given a slight arch. Roof bricks are 12 inches thick, but are thickened somewhat around the ports.

The special electrode economizers developed by the Electric Furnace Construction Co., Philadelphia, and fitted on the existing Greaves-Etchells type furnaces at the Ford Motor Co. plant will again be used on the large furnace and on the two 10-ton furnaces.

For tilting the furnace a 65-horsepower motor is used. A double spur

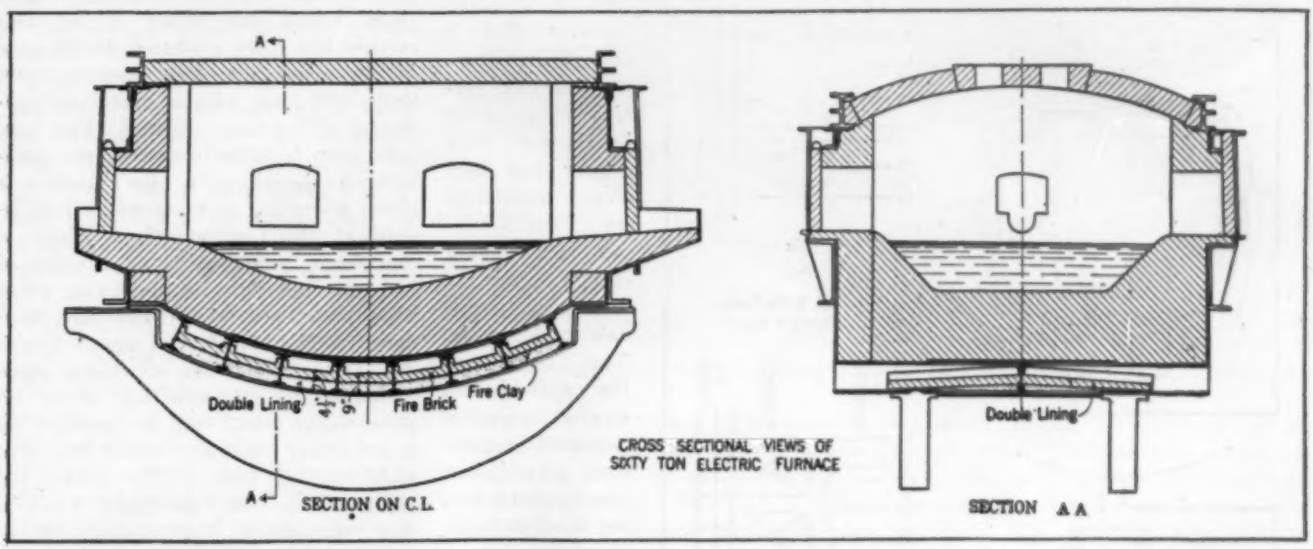


FIG. 2—SKETCH SHOWING GENERAL DESIGN AND LINING OF THE GREAVES-ETCHELLS TYPE OF FURNACE

gear reduction operates a horizontal screw, which is placed under the center of the furnace. The screw moves a nut to which are fastened two connecting rods, in turn fastened to a heavy casting bolted to beams under furnace. The screw and nut are enclosed in an oil tight housing and operate in an oil bath. Limit switches are provided to prevent overtravel.

The whole of the tilting mechanism and under part of the furnace is protected in case of a run out by a double lining consisting of plate work covered with firebrick, lying under the proper furnace shell. This lining slopes from the center outwards.

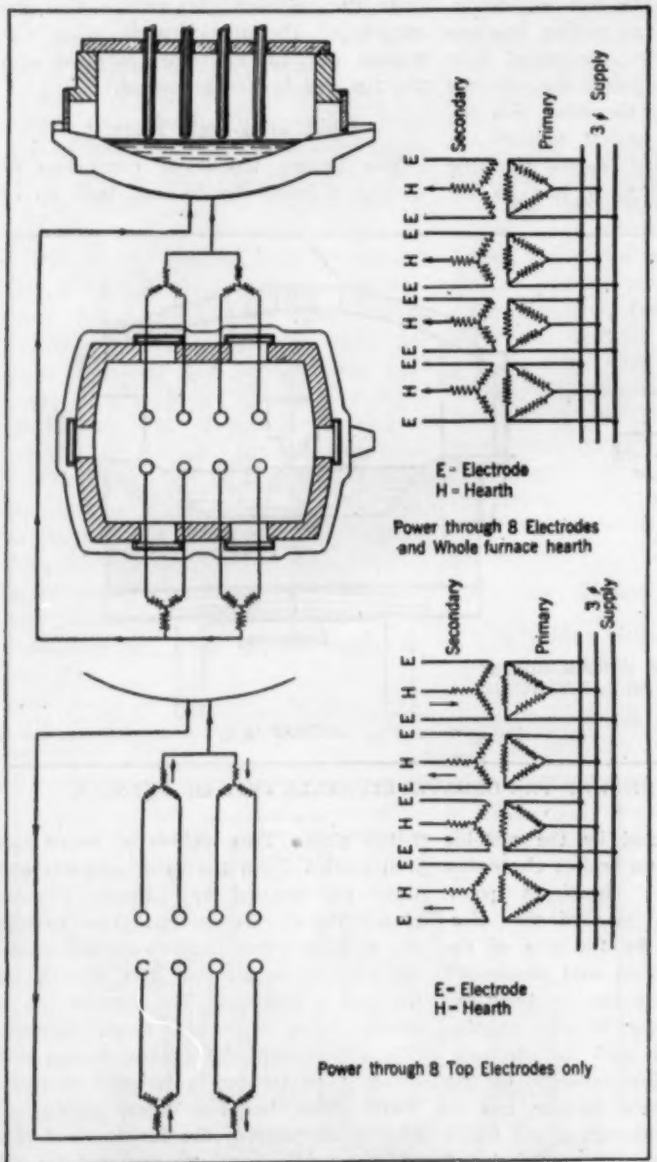

Secondary
Primary
3 ϕ Supply
E H E E H E E H E E H E
E - Electrode
H - Hearth
Power through 8 Electrodes and Whole furnace hearth
Secondary
Primary
3 ϕ Supply
E H E E H E E H E E H E
E - Electrode
H - Hearth
Power through 8 Top Electrodes only

FIG. 3—DIAGRAMMATIC PLAN AND ELEVATION OF 60 TO 80-TON FURNACE DESIGNED FOR THE FORD MOTOR CO., DETROIT

Supporting the Electrodes

The electrodes and motors are carried on a top platform above the furnace, supported by six vertical channel columns with horizontal supporting beams. These main supports are suitably tied together, braced by structural members, and covered with steel plate, on which electrode motors and gearing are placed. The electrode holders are hung by two steel chains passing over sheaves to a winding drum and have insulated guide rods. This top arrangement of gearing, motors, etc., leaves the furnace body clear for metallurgical operations and enables the actual furnace shell to be designed solely for holding metal. The furnace is designed to operate on a variety of voltages and with such heavy currents that it has been necessary to pay special attention to interlacing the copper bus bars from transformers. Flexible copper strips carry current from the interlaced terminals to electrodes. The whole of the switchboard, control equipment automatic regulators, oil switches, transformers, etc., are located under the furnace stage level and the only electrical equipment showing above furnace stage will be two control pillars fitted with varicolored lights. The new plant at the Ford Motor Co. also includes two 10-ton Greaves-Etchells type furnaces, each with four electrodes and 3000 kilovolt-ampere transformers, but no description of these will be attempted in this article beyond saying that these, like the 60-ton furnace, are so designed that they can operate either as acid or basic, with power either entirely through top electrodes or merely by change of position of oil switch with power through top electrodes and the whole of the furnace hearth.

The furnace hearths are quite solid, with no studs, water cooling or embedded electrodes. The whole of the hearth acts as a huge electrode if power is put through it by the switch arrangement previously mentioned. The operation of the Ford furnaces will, in the writer's opinion, mark a new advance in the science of steelmaking and prove that the scope of the electric furnace is not confined to small melting furnaces for high grade steels but can economically be an essential part of the process of making all steel.

Steel Plant in India Is Being Expanded

The new blast furnace of the Tata Iron & Steel Co., Jameshedpur, Bengal, India, which was blown in last December has since produced 48,600 tons of pig iron, the daily average rate being 400 tons, with a coke consumption of 2275 pounds per ton. Two new coke oven batteries recently have commenced operation at the company's plant, according to a statement just issued at the London office. Coke is now being produced at an average of 938 tons per day. A duplexing plant which was started in February produced 3000 tons of steel up to March 30. Other extensions are being made including the construction of a tin plate works which will be operated by a subsidiary company called the Tinplate Co. of India. The annual capacity of the old Tata plant, which is now working at full capacity, is as follows: Pig iron, 280,000 tons; steel ingots, 187,000 tons; coke, 360,000 tons; rails, angles, track fastenings, plates, bars, etc., 150,000 tons; and blooms, 160,000 tons.

Buys Electric Mill Drive

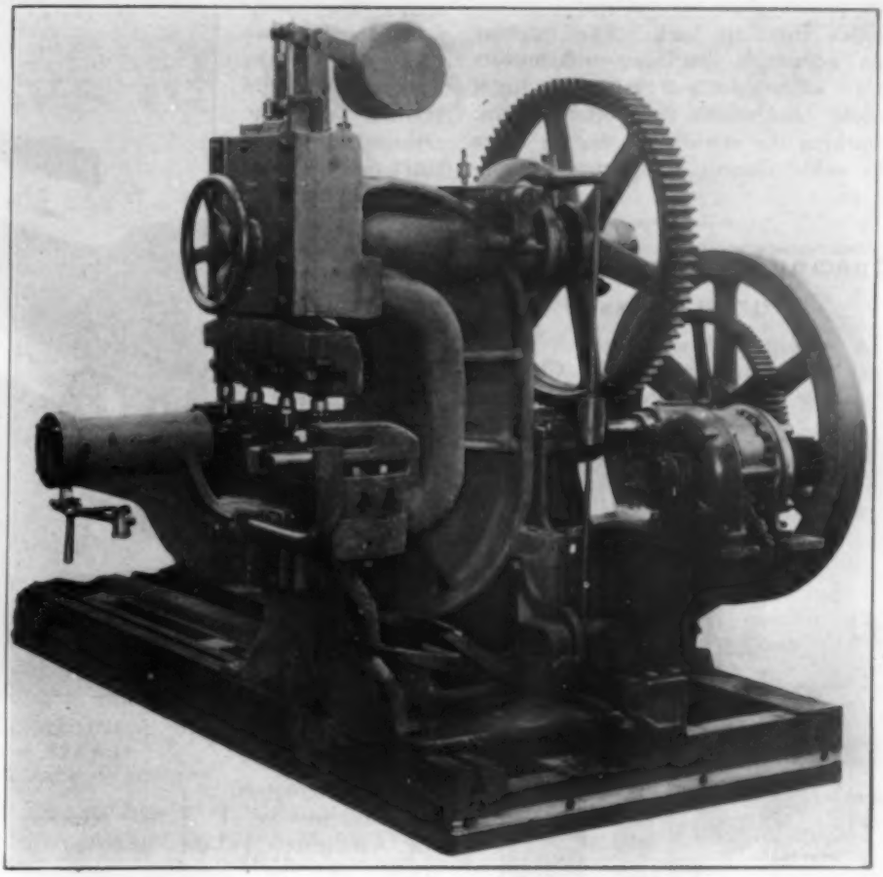
A double-unit, reversing motor for driving a 40-inch reversing blooming mill has just been purchased from the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., by the Bethlehem Steel Corp. for its recently acquired Lackawanna plant at Buffalo. The total cost of the equipment was close to $250,000. The continuous rating of the motor is 7000 horsepower at a speed of 50 revolutions per minute, but it is built to withstand peaks of 19,000 horsepower. Speed ratings range from zero to 120 revolutions per minute. Power for the motor will be supplied by a flywheel motor-generator set, consisting of two 3000-kilowatt generators, a 3750-horsepower motor and a 100,000-pound flywheel. The unit as it will be installed will include complete control equipment and switchboards.

Builds Pyramid Type Bending Roll

A pyramid type bending roll having a 10-foot 2-inch span between housings recently has been introduced by the Cleveland Punch & Shear Works Co, Cleveland. A view of the new machine is shown in the accompanying illustration. This new development is direct-connected, motor-driven and is entirely self contained. The machine is also equipped with a power device for raising and lowering the top roll.

One of the two lower rolls is 8 inches in diameter and has three splines, while the other has two splines and a flanging groove. The upper roll is 11 inches in diameter. The machine is so designed that none of the gears protrude into the foundation.

Two clutches are provided permitting the raising and lowering of either end of the top roll. An additional single clutch is used for starting the rolls. The outer drop hinge can be dropped by lifting the cover plate and dropping the yoke.



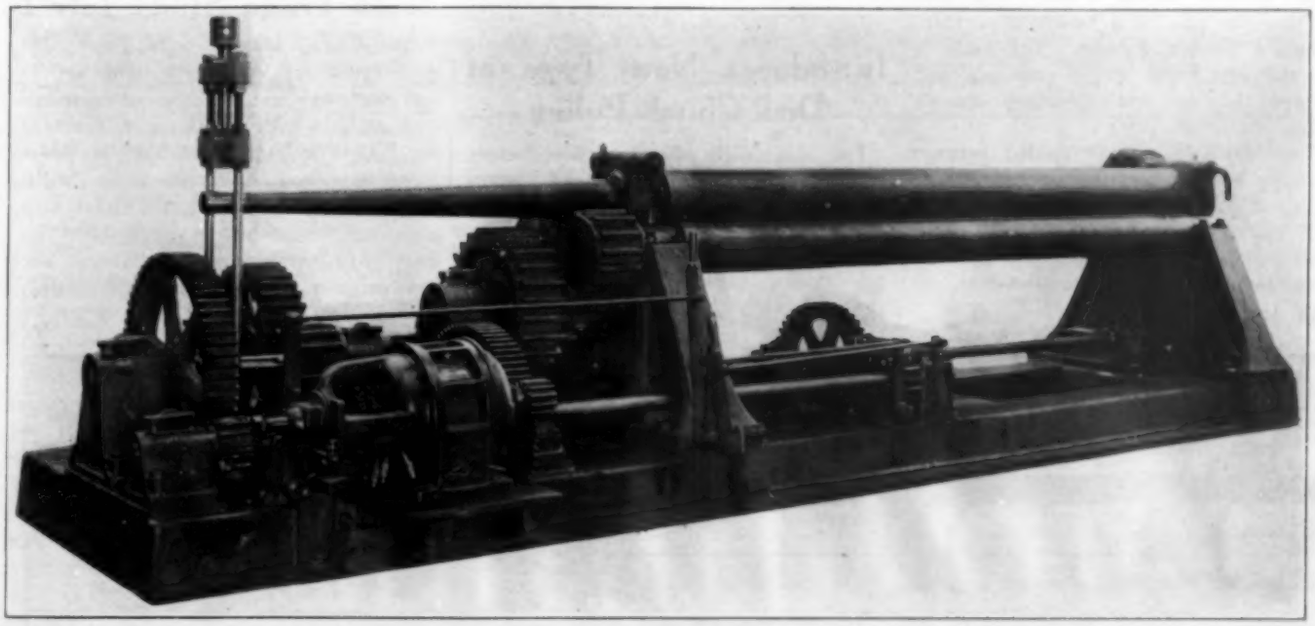
A COMBINATION PUNCH PRESS WHICH HAS ADJUSTABLE ATTACHMENTS

Punching Machine Handles Angular Work

To accommodate work requiring the punching of a number of angles, the Cleveland Punch & Shear Works Co, Cleveland, recently has introduced a punch press which can be operated in multiple. A view of the new press is shown in the above illustration.

Three presses of the type shown when built into a single unit furnishes a desirable combination for use when a number of angles are to be punched. One machine of the set of three is stationary while the other two machines are adjustable by hand. Each air cylinder may be operated individually or all three may be operated simultaneously from the stationary end.

Individually adjusted attachments permit a minimum of 2 inches and a maximum of 20 inches between attachments on each machine. The angles may be punched on either leg without the necessity of turning end for end. Air cylinders are used to hold the angles firmly against the gage block in a straightened condition. Supports are provided for the angles. Gage blocks are adjustable to permit

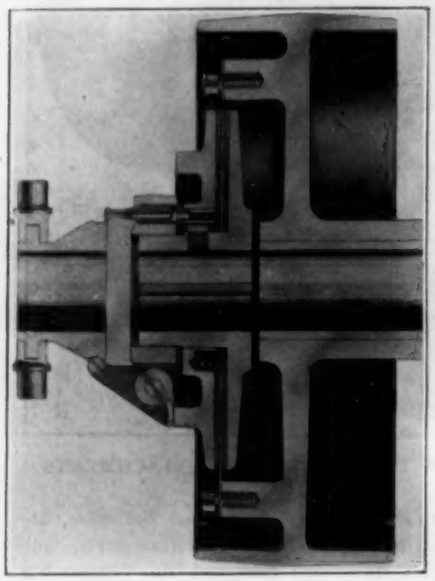


DIRECT-CONNECTED, MOTOR-DRIVEN BENDING ROLL HAVING A POWER LIFT FOR RAISING AND LOWERING THE TOP ROLL

the punching of various gages in the angles front to back. The machine has adjustable punching attachments and adjustable bell mouthed gage blocks and angle supports. When punching the angle with the leg down the angle support automatically disappears.

Spacing Machine Used With Punch Presses

A spacing machine for punch presses has been introduced by the Cleveland Punch & Shear Works Co., Cleveland.



CLUTCH PULLEY BUILT TO STAND HARD USAGE

This machine can be operated with practically any architectural jaw, open gap, single punching machine or may be used with a regular I-beam type machine. The table will handle as a maximum a 24-inch I beam. The table is of the open side, single rail type and permits loading and unloading directly from the front.

The movable rail is guided between rollers located on the stationary tie rails. The movable rail is fitted with end castings carrying the clamps. One end casting remains stationary and the opposite casting may be adjusted to suit the length of the material. Fig. 1 shows the clamp released and thrown back so that the clamps and end castings may be returned over the fabricated material for reloading. The movable rail is propelled by rack and pinion and a handwheel. This propelling mechanism is shown in Fig. 2.

The stopping of the table may be accomplished in various ways as follows: By the use of adjustable stops made of rectangular pieces of steel as indicated by *A* in Fig. 2; by hardwood stops with pins as shown by *B*; or with notched wooden templets as indicated by *C*. By revolving the handwheel in the direction of travel of the material, indicated by the arrow, the stops are brought in contact with the dog shown at *D*. The whole is punched at this point, and wheel rotated slightly backward, which causes the dog to release the stopping device. This backward movement of the wheel does not cause the work to move backward, but keeps the material continually progressing. A steel tape is inserted at the point *E* as shown in Fig. 2 to facilitate the setting of the stops.

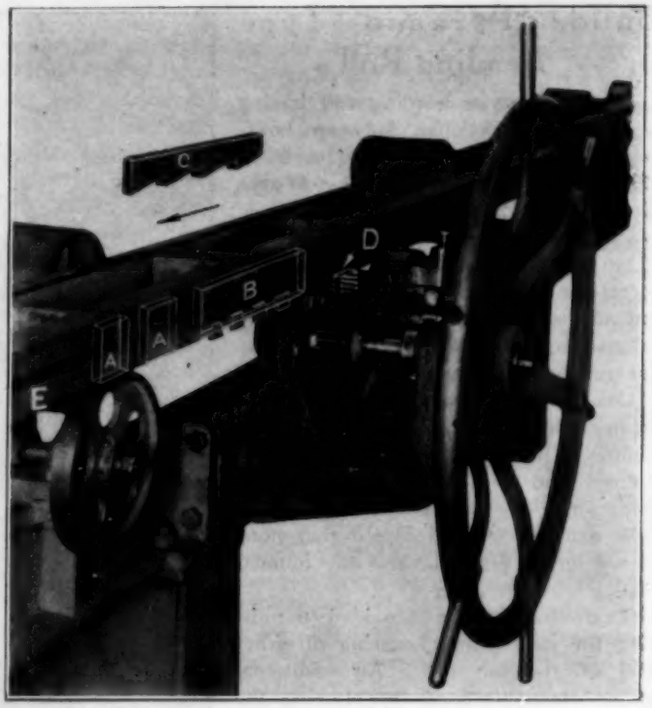


FIG. 2—ACTUATING DEVICE FOR SPACING TABLE WHICH ALWAYS MOVES THE MATERIAL IN A FORWARD DIRECTION

Introduces New Type of Disk Clutch Pulley

For use with direct drive factory equipment, an adjustable clutch pulley recently has been introduced by the Twin Disc Clutch Co., Racine, Wis. A sectional view of this new device showing the various adjustable parts, is shown in the accompanying illustration. It is claimed that the use of this clutch with direct drive on various machines cuts production costs by eliminating the wearing of belts by the fraying of edges on the belt shifter. The new pulley is designed to permit easy adjustment. One pin controls the adjusting mechanism with a possible refinement up to 0.005 inch. No tools are required to complete this operation. It is claimed that the design of this clutch assures a positive engagement and that the mechanism will not heat.

Begin Trade Study July 1

Washington, May 15.—On July 1 the department of commerce will set in operation its new division of domestic trade, which will inaugurate a study of distribution and transportation problems. Irving S. Paull, of Lambertville, Mich., who formerly was with the joint congressional committee on agricultural inquiry, will be chief of the division. The appropriation for the year beginning July 1 is $50,000.

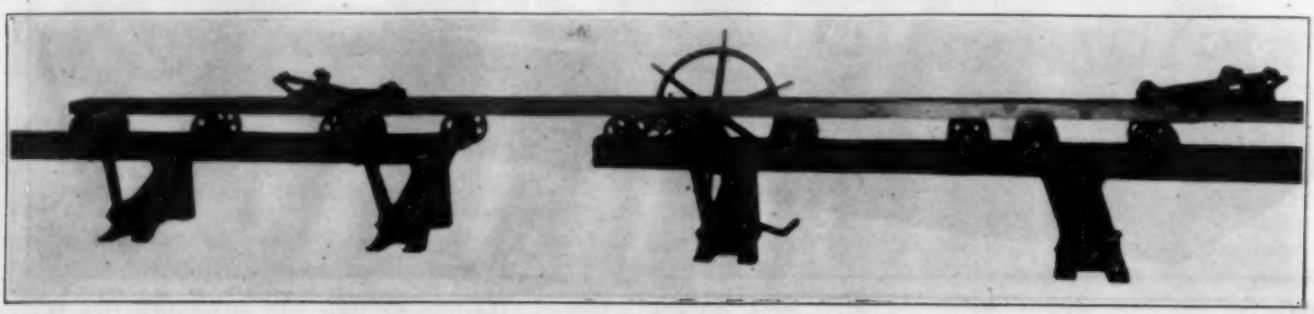


FIG. 1—HAND SPACING MACHINE WHICH WILL HANDLE AS A MAXIMUM A 24-INCH I BEAM

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

THE twenty-sixth annual convention of the American Society for Testing Materials will be held at Chalfonte-Haddon Hall, Atlantic City, N. J., during the week of June 25. Due to the increased volume of reports and papers to be considered at this meeting, it will be necessary to hold 13 sessions, the first session on Monday night and closing with the last session on Friday night, June 29. The provisional program in part is as follows:

MONDAY, JUNE 25

Evening session, 8 p. m.—Minutes of twenty-fifth convention; report of committee on copper wire; "Methods of Casting Test Specimens of Gun Metal," E. H. Dix Jr.; "The Influence of the Ratio of the Length to Diameter in Compression Testing of Babbitt Metals," J. R. Freeman Jr.; report of committee on screen wire cloth; report of committee on metallography; announcement of officers.

TUESDAY, JUNE 26

Morning session, 9:30 a. m.—Committee reports on corrosion of iron and steel, corrosion on nonferrous metals, magnetic analysis, magnetic properties; "Endurance Properties of Steel; Their Relation to Other Physical Properties and to Chemical Composition," D. J. McAdam Jr.; "Resistance of Manganese Bronze, Duralumin and Electron Metal in Alternating Stresses," R. R. Moore; "A New Method of Magnetic Inspection," A. V. de Forest.

Afternoon session, 3 p. m.—Committee reports of wrought iron, cast iron, coal and coke, heat treatment of iron and steel; topical discussion, "Is It Desirable to Include Chemical Requirements in Cast Iron Specifications?" affirmative Robert Job, negative Richard Moldenke; "Properties of Metallurgical Coke," G. St. J. Perrott and A. C. Fieldner; "The Significance of Tool Temperatures as a Function of the Cutting Resistance of Metals," H. A. Schwartz and W. W. Flagle.

WEDNESDAY, JUNE 27

Morning session, 9:30 a. m.—Report of executive committee; "The Relation of the American Society for Testing Materials to Research in Engineering Materials," George K. Burgess, president; "Gases in Metals," Louis Jordan; "New Developments in Telemetric Devices," O. S. Peters and R. S. Johnston; "Optical Strain Gages and Extensometers," L. B. Tuckerman; committee reports on paper and publications, steel and methods of testing.

Afternoon session, 3 p. m.—Committee meetings.

Evening session, 8 p. m.—Symposium on consistency; introduction, F. G. Breyer and Henry Green; Resume on Consistency: Nomenclature and Methods of Testing, A. T. Golbeck; "A Penetration test for Workability in Concrete Mixtures with Particular Reference to the Effects of Certain Powdered Admixtures," J. C. Pearson and F. A. Hitchcock.

The sessions on Thursday will be devoted to the subjects of road materials, waterproofing, thermometers, timber, rubber, textiles, preservative coatings, cement, lime, gypsum and ceramics. Committee D-1 will report on preservative coatings for structural work at the Thursday evening session and reports also will be made on brick and refractories. Petroleum products, electrical insulating, materials, slate and concrete will be considered at the Friday sessions. A report will be made of the progress in the study of reinforced concrete by a joint committee on concrete and reinforced concrete by Richard L. Humphrey.

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Discusses Furnace Development

Richard Peters, Jr. of Robert C. Lea & Co., Philadelphia, addressed the Philadelphia section of the American Institute of Mining and Metallurgical Engineers, May 8, on the development of blast furnaces from their earliest form to the modern types.

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Discuss Welding

The subject of welding was discussed from many angles at the regular May meeting of the Hartford, Conn., branch of the American Society of Mechanical Engineers held Monday evening, May 14, at the City club, Hartford, Conn. P. P. Pipes, welding engineer of the Lincoln Electric Co., and E. L. Brown, welding engineer of the Metal Thermit Corp., each presented an illustrated paper.

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Organize Engineers Club

The Hartford Engineers club was organized in Hartford, Conn., May 8, with 500 charter members and the following officers: President, Hiram Percy Maxim; first vice president, Frank P. Gilligan; second vice president, Edward W. Bush; secretary, Kenneth B. Warner; treasurer, Henry R. Buck; councillors for 1 year, Robert Charles Cole and William F. Brooks; councillors for 2 years, Sherwood F. Jeter and Frederick C. Moore. The object of the club is to encourage friendly intercourse among Hartford engineers and promote their professional advancement, to encourage the arts and sciences connected with engineering. The next meeting will be held June 5.

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Entertains Foundrymen

At the invitation of the General Electric Co., the May meeting of the New England Foundrymen's association was held May 9 at the River Works plant of the company, West Lynn, Mass., instead of at the Exchange club, Boston, as is customary. The meeting started at two o'clock in the afternoon and included an inspection of the various foundries and other departments of the large plant. A complimentary dinner served from the company kitchen was followed by a talk by Nelson G. Darling, manager of the River works. Later H. M. Lane, industrial engineer of Detroit spoke on "Foundry Riggings Speed Up Output" taking as his example the foundry of the Wilson Foundry & Machine Co., Pontiac, Mich.

Convention Calendar

May 14-16—National Association of Manufacturers of the United States of America. Annual conference, Waldorf-Astoria, New York.

May 15-16—National Pipe & Supply Association. Convention at Cincinnati. Geo. L. McIlvane, 909 Oliver building, Pittsburgh, is secretary.

May 15-17—American Iron, Steel and Heavy Hardware association. Annual convention, Drake hotel, Chicago. A. H. Chamberlain, Marbridge building, New York, is secretary.

May 15-18—National Association of Purchasing Agents. Annual convention at Cleveland. O. H. R. Heydon, 19 Park place, New York, is secretary.

May 17-19—National Supply and Machinery Dealers association; Southern Supply and Machinery Dealers association; and American Supply and Machinery Dealers association, triple convention, Cincinnati. F. D. Mitchell, 1819 Broadway, New York, is secretary.

May 25.—**American Iron and Steel institute.** Spring meeting, Hotel Commodore, New York. E. A. S. Clarke, 40 Rector street, New York is secretary.

May 28-31—American Society of Mechanical Engineers. Spring meeting at Montreal. Calvin W. Rice, 29 W. Thirty-ninth street, New York, is secretary.

June 11-14—Electric Power club. Annual meeting, Hotel Homestead, Hot Springs, Va. S. N. Clarkson, Kirby building, Cleveland, is secretary.

June 14-15—American Society for Steel Treating. Spring sectional meeting, Hotel Bethlehem, Bethlehem, Pa. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

June 20-23—American Institute of Chemical Engineers. Summer meeting at Wilmington, Del. J. C. Olson, Polytechnic institute, Brooklyn, N. Y., is secretary.

June 25-29—American Society for Testing Materials, annual meeting at the Chalfonte-Haddon hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.

June 25-29—American Institute of Electrical Engineers. Annual convention at Swampscott, Mass. F. L. Hutchinson, 33 West Thirty-ninth street, New York, is secretary.

Urges More Flexible Immigration

Chamber of Commerce of United States in Its Annual Meeting States Present Law Is Not Adaptable to Changing Conditions—Favors Establishment of a Court of Tax Appeals—Reaffirms Open Shop Stand

EXHAUSTIVE symposiums dealing with important phases of commerce and industry featured the eleventh annual meeting of the Chamber of Commerce of the United States, held with headquarters at the Waldorf Astoria hotel, New York, May 8-11. Interest ran high, and at some sessions, held in the Metropolitan and Hippodrome theaters, 5000 to 6000 were in attendance. Among the principal speakers was Herbert Hoover, secretary of commerce, whose address was reported in part in the May 10 issue of IRON TRADE REVIEW. Julius H. Barnes was re-elected president and John Joy Edson, treasurer of the chamber since its inception, also was returned to office.

The chamber of commerce adopted resolutions urging greater flexibility and the principle of selection in immigration; declared for an adequate merchant marine, but depreciated direct governmental operation thereof, favored an international conference for the early settlement of war debts, reclamations, and similar problems; advocated legislation enabling taxpayers to have prompt and conclusive settlement of a tax liability; and declared allegiance to the permanent court of international justice.

Because of lack of flexibility, the chamber resolved, the present 3 per cent immigration law is not adaptable to changing conditions. In order to overcome this defect, and at the same time to make a distinction between immigrants who can directly add to the national strength and those who cannot, there should be added to the present 3 per cent quota, a possible 2 per cent quota upon a selective basis. This, the resolution read, would provide flexibility that would care for proven economic needs without effecting social standards.

In the resolution on taxation, the chamber of commerce went on record as favoring the establishment of a court of tax appeals to be appointed by the President and composed of citizens not connected with the treasury department, which would sit in various centers of the country convenient to access of taxpayers. A brief resolution was adopted pledging support and co-operation to the United States coal commission in its investigations and reiterated the chamber's adherance to the principle of the open shop. It also recommended to congress the encouragement of commercial aviation; and urged that the United States take appropriate action for the ratification of the revised Hague rules respecting bills of lading.

Speaking on immigration, Congressman Albert Johnson, chairman of the house committee on immigration and author of the quota law, stated that President Harding had not changed his views on this subject and predicted that restrictions would be tightened rather than be broken down at the next session of congress. Robert S. Binkered, secretary of the Association of Railway Executives, pointed to a new decentralization movement in industry, manufacturers now paying greater attention to such matters as proximity of power and raw material. He also stated that the railroads today are collecting only the prewar percentage of values of the commodities shipped, and that if sometimes rates seem high, manufacturers must remember that commodities are higher in value than they were.

The three-dimensional method in teaching employes fundamental economics was suggested by Carl F. Dietz, president of the Bridgeport Brass Co., Bridgeport, Conn. By using several series of colored blocks, he demonstrated how the function of the dollar in company buying, company selling, wage relations and the like, is illustrated to workers at the Bridgeport plant.

Industrial leaders were called upon by Gen. Frank T. Hines, director of the veterans' bureau, to aid the government in placing 600,000 incapacitated veterans now undergoing vocational training. The average length of training of all men now receiving instruction is more than two and a half years.

Strike for Recognition

Terre Haute, Ind., May 15.—Two hundred men employed in the molding departments of the Inland Iron & Steel Co., the Terre Haute Malleable & Mfg. Co., and the Standard Malleable Casting Co., all of Terre Haute, are on strike to force recognition of the molders' union. The action of the men, it is said, was taken against the advice of a union organizer. Officials of the companies involved say no demands were made.

Many Still Out of Work in British Trades

European Staff Correspondence

Birmingham, England, May 3.—The British ministry of labor's Gazette for April was issued much later than usual owing to labor troubles in the printing office. The customary particulars are given for employment in March. In the iron and steel works employment gained 1.1 per cent over February, and 44.1 per cent over March, 1922.

In the engineering trades, while employment is described as bad there was an improvement in the majority of districts. Trade was affected by increased prices of materials. In the shipbuilding and ship repairing trades business was very bad, though showing a slight improvement. In coal mining there was a gain for the month, and also over March, 1922. The output of coal during the four weeks ending March 24 was 22,702,600 tons, compared with 22,246,800 tons in the four weeks ended Feb. 24, and 19,921,000 tons in the four weeks ended March 25, 1922. The exports of coal, including coal shipped for the use of steamers in the foreign trade and the coal equivalent of coke and manufactured fuel, amounted to 9,084,334 tons, or 1,291,493 tons more than in February.

The returns of unemployment show 30 per cent out of work in the shipbuilding trade; 17.6 per cent in engineering and iron-founding and 15.3 per cent in iron, steel, tin plate and galvanized sheet manufacture. In coal mining 3.6 per cent were unemployed, and in iron mining and ironstone quarrying 16.2 per cent.

Wage changes in March resulted in a reduction of over £64,000 in the weekly full-time wages of about 920,000 work people and in an increase of about £650 in the weekly wages of over 16,000. In January, February and March there was a net reduction of £160,000 in the weekly earnings of nearly 1,600,000 work people, and a net increase of about £19,500 in the weekly wages of nearly 190,000.

Review Metal Trades Prospects

Large Majority of Members of National Association Report Outlook Is Good—Comparisons of Operating Rates and Wages, and Other Data Given in Replies to Annual Questionnaire

OUT of 645 replies to the "annual report questionnaire" of the National Metal Trades association, 325 stated that their business outlook for the next six months is "good"; 137 said "very good"; 156 "fair"; 9 "poor" and 3 "very poor." Fifteen did not answer the question. The questionnaire was sent out Feb. 10, and the tabulation of replies has just been issued by the association. The questions and their replies afford an interesting view of operations in the metal trades. The first question was:

With a nominal capacity as a basis, what was your rate of operation in January, 1923? The replies were as follows:

Percentage	Number of Firms Reporting
1 to 20	18
21 to 40	50
41 to 60	109
61 to 80	182
81 to 100	264
No report	22
	645

What was your rate of operation in January, 1922?

Percentage	
1 to 20	86
21 to 40	169
41 to 60	192
61 to 80	108
81 to 100	62
No report	28
	645

Percentage increase or decrease in total number of man hours per week for January 1923 as compared with January 1922:

Percentage Increase	
1 to 25	105
26 to 50	122
52 to 75	75
76 to 100	61
101 to 200	120
201 to 300	38
301 to 500	19
Over 500	10
No change	29
No report	23
Percentage, Decrease	
1 to 25	30
26 to 50	9
51 to 100	4
	645

Ratio the number of employes for January 1923 bears to January 1922:

Percentage Increase	
1 to 25	168
26 to 50	112
52 to 75	79
76 to 100	52
101 to 150	68
151 to 300	48
301 to 500	12
Over 500	6
No change	37
No report	15
Percentage Decrease	
1 to 25	30
26 to 50	14
51 to 100	4
	645

What were the average hourly earnings in January, 1923 as compared with January 1922?

Percentage Increase	
1 to 8	196
9 to 15	73
16 to 24	25
25 to 35	25
No report	36
No change	123
*Percentage Decrease	
1 to 8	108
9 to 16	40
17 to 24	17
25 to 35	2
	645

*Some of the above wage decreases are due to a number of firms who were not operating to any extent during January, 1922, retaining a number of their high priced skilled mechanics. However in January, 1923 their operating forces had been greatly increased with operators and specialists and this caused a decrease in the average rate.

Wage system or systems prevailng in plants:

Hourly rate	297
Piece work	20
Premium	16
Bonus	4
Combinations	301
No report	7
	645

Is there a scarcity of the following?

All-round men	79
Operators	61
Common labor	48
All-round men, operators and common labor	110
All-round and operators	70
All-round and common labor	31
Operators and common labor	14
No report	13
No scarcity	219
	645

Do you train the following?

Apprentices	126
Operators	61
Apprentices and operators	72
Apprentices and foremen	14
Operators and foremen	41
Foremen	6
Apprentice, operators and foremen	170
Do not train	143
No report	12
	645

Has your plant been involved in any labor difficulty since April 1922?

No	642
Yes	3
	645

The annual meeting of the New Haven, Conn., branch of the National Metals Trades association was held at Hotel Taft, New Haven recently. Robert McArthur of the Geometric Tool Co., president; George A. Whitney of the New Haven Clock Co., treasurer, and Theodore F. Silkman, secretary, were continued in office.

Railroad Shop Employes Ask for Wage Raise

Pittsburgh, May 15.—A wage increase of approximately 30 per cent is asked by the shop employes of the Pittsburgh & Lake Erie railroad in a letter received by J. B. Yohs, vise president and general manager of the road. It is said similar letters have been received by other railroad companies throughout the country and that the increase asked involves about $50,000,000 annually. The letter states that regular apprentices should receive a minimum starting rate of 47 cents an hour, with an increase of 2½ cents an hour every six months up to and including the first three years; 5 cents more for the first six months and 7½ cents for the last six months of the fourth year.

New Bar and Small Shape Mill Under Erection

The newly organized Walsh & McGee Steel Co., 2 Rector street, New York, has begun work on the erection of a rolling mill plant at Newark, N. J., which is to produce 2-inch and smaller channels, 1½-inch and smaller angles and ½-inch and smaller rounds and squares. The rolling unit will be a semi-continuous, 8-inch mill of the latest design, built by M. Hoagland, Rockaway, N. J. Tate-Jones & Co., Inc., Pittsburgh, will furnish the billet heating furnaces and the Crocker-Wheeler Co., New York, will furnish the motors. The plant is to be located on Newark bay, where piles have been driven and the concrete foundation now is under way. It is expected that the plant will be ready to produce shortly after July 1. The plant will be served both by the Lehigh Valley railroad and the Central Railroad of New Jersey. Harry L. McGee, formely vice president of the Concrete Steel Co. is president.

Robert H. Moore, who has been appointed receiver for the Capron Co., Providence, R. I., maker of jewelry, will sell the machinery, tools, etc.

Greater Stablization Is Needed

Machine Tool Builders Consider Methods for Safeguarding Industry Against Its Characteristic Irregularties—Better Study of Market and of Business Trends in Related Industries Considered Essential—Continued Business Improvement Less Certain

BETTER stabilization of the machine tool industry to safeguard it against the short fluctuations of business to which it is peculiarly subject and to allow it the widest field of useful development, focused the thoughts and discussions of the manufacturers in attendance upon the spring meeting of the National Machine Tool Builders' associations at White Sulphur Springs, W. Va., May 9, 10, and 11. It was recognized that the machine tool industry inherently is a highly irregular branch of business and that the proper solution of its problems calls for special study and analysis on the part of those engaged in it as producers.

Emphasis was laid strongly upon the importance of a more thorough familiarity by the manufacturers with business conditions and trends in other lines of industry which constitute the important sources of machine tool demand. Considerable attention was given to the advisability of individual manufacturers setting up in good years a contingent burden reserve based on hourly production rates calculated over a period of five years preceding and of employing this fund against the heavy charges of lean years. This plan was explained in considerable detail by President Kearney of the association who stated that it has been put into effect by his own company.

The importance of the cultivation of greater self respect in the machine tool industry as contributed toward its highest development and usefulness was presented by C. Wood Walter of the Cincinnati Milling Machine Co. The machine tool industry needs leadership as keenly today as it did a year ago when business conditions were so discouraging and manufacturers must set their minds and hearts to work if they are to take the due measure of pride in their business that they should be entitled to derive. "We should hold onto the self-respect that rightfully belongs to the makers of the master tools of industry," said Mr. Walter. "We should get the fundamental economic facts of our industry with each manufacturer contributing in accordance with the government's advice. Then let us conduct our industry on a sound basis as derived from these facts."

No further large expansion of the present market for machine tools may be expected in view of conditions developing in closely related industries, said Mr. DuBrul, general manager of the association, in his report to the membership. Summarizing the present business outlook in machine tools, Mr. DuBrul said:

"Since last October there has been a considerable increase in activity in the industry. According to our barometer the average of percentages of orders of the members reporting has risen from approximately 25 per cent, around which point it hung from July to December, and registered 46 per cent for March business. The machine tool industry is still far from the booming condition that has existed for the last few months in some other industries.

"As we read the signs of the business cycle, it is not likely that this condition will improve very rapidly from now on, because the activity of other industries is limited by the supply of labor, and until a more ample supply of labor is available we are not likely to witness much expansion of manufacturing facilities. The machine tool business necessarily shows its greatest activity when other industries are greatly expanding their facilities.

Building Boom Tapering

"The figures on building operations indicate that the end of the building boom is very close at hand. Mr. Hoover advocated that all government and public projects be suspended until the present building programs are out of the way. Some of our studies indicate that construction of industrial buildings predicts machine tool demand. It is very natural that as new plants are installed new machinery should be required for them. It is, therefore, significant that the figures on industrial buildings indicate no rising tendency. The high cost of buildings at the present time will likely prevent many projects heretofore contemplated from reaching the point of contracting.

"Moreover, the outlook for mortgage money rates is unfavorable. The rates are relatively high, and tending higher. It does not pay large industries to pay high rates for money with which to construct buildings on an inflated price basis, and later find that a deflation of values will prevent the earning of a profitable rate of return on these buildings.

"Railroad buying has not been as large as it should be in view of the conditions of the railroad shops, which are very badly in need of much new equipment. But no matter how much they might like to have new equipment, the railroads do not buy it unless they can see good prospects of paying for it. The public attitude towards railroad credit has prevented their keeping up with the needs of the country and with certain clouds in the political horizon, investors will not readily advance the funds that the railroads actually should be spending.

"It has now been visibly demonstrated by statistics and charts that the machine tool business is one of the most irregular of industries, and is subject to longer and deeper depressions than the average. Therefore, it is of prime importance, and should be of great interest to all machine tool builders, to use every means available in forecasting conditions so as to keep their own individual businesses in a healthy state. The better forecasts all business men in the country learn to make, the less serious will be the swings of the business cycle.

"It is the social duty of industrial managers to use every available means in making good forecasts. The growth of radicalism will become more and more marked unless these fluctuations are better controlled. The movements shown in the big swings are always the sum of the individual movements of individual business managers. Only by individual study and individual action can the excesses of the general movements be minimized."

The report analyzed at considerable length the findings and recommendations recently made by the committee of economists and business men appointed by Secretary Hoover to study the business cycle and unemployment. Mr. DuBrul urged upon the machine tool builders the importance to themselves to take advantage of the information developed by the Hoover committee in endeavoring to correct the economic evils of the business arising from the violent fluctuations to which the latter is subject. He thought each machine tool builder should do his share in controlling the business cycle by a more complete understanding of general business conditions and their probable future trend and particularly in those lines of industry where large demands for machine tools originate; by a better knowledge and appreciation of the basic facts of his own industry which would lead to the formulation of safer and sounder business policies.

"No factory can long produce a steady flow of goods to the limit of its capacity," said Mr. Dubrul. "For a short time a manager may experience this ideal condition, but he is sure to find that before long something or other is interfering with the desired flow. This is true for every industry as a whole. It is important that the causes of these interruptions be ana-

lyzed and classified in order to anticipate and if possible avoid them.

"During the war the government was pushing contractors for materials of all kinds. Great confusion resulted merely because for a long time the ordnance department did not get down to analyze the reasons for nonproduction of ordnance. Finally someone in the government service called on Dean Herman Schneider of the University of Cincinnati to study the situation to see how the confusion could be straightened out. Dean Schneider attacked the problem by first classifying reports of different causes of delay. After he had a number of them classified he found that they naturally grouped themselves under seven general headings, and it was found that in all cases lack of one or more of these few factors prevented the contractor from completing his contract.

"These factors were, Capital, Labor, Material, Equipment or Buildings, Transportation, Fuel, and in some cases Weather Conditions. After this simple but very valuable discovery was made, it was much easier to take the proper steps to overcome the trouble. After the war, Dean Schneider suggested that any industry or any business man need add only one more factor, Demand, or orders.

"The machine tool builder must forecast these few factors if he is to make a success. Naturally, some of them affect others. Lack of transportation will affect the supply of both fuel and material. If a plant cannot get outbound transportation to carry away machines that it has on hand, its customers will cancel orders and seek elsewhere for better deliveries. If the buildings or equipment are not sufficient to handle this amount of orders to be had by the selling department in a given length of time, customers will be lost to plants that can supply the demand. So, too, if lack of orders, material or fuel causes a shut down or partial operation of plant, desirable workmen will go to a plant that works more regularly.

"If and when one misses his guess on any one of these few factors he does not attain as near to capacity production as he could were his forecasts more accurate. There being so few factors to forecast, all of these few should and can be kept in view not only for the immediate present but for some months ahead."

Subsequently, Mr. DuBrul reported that on the basis of the tabulation just completed, April orders for machine tools represented 42.2 per cent or some recession from March.

Discussing prospective market conditions and the various outlets for machine tools, W. A. Viall of the Brown & Sharpe Mfg. Co., Providence, R. I., expressed the opinion that the automobile industry on the whole was fully equipped except for special tools and that no large immediate market could be expected from that direction. However, some business was to be derived from the expected expansion of the manufacture of trucks. Continued growth of demand is to be looked for from the electrical industry but the railroad situation has remained an uncertain prospect as this class of users constantly have been behind in its requirements and there is no clear assurance when these deferred needs will be made up. The creation and expansion of the radio has been an unexpected demand for tools and has stimulated the development of several new lines.

Considerable discussion was participitated by the shortage of skilled mechanical labor experienced by various builders and by the drafts being constantly made upon the working forces of the machine tool industry by other lines of manufacture. E. Fred Geier of the Cincinnati Milling Machine Co. declared that the problem was a fundamental one and that the machine tool industry must put istelf in a position where it could keep its men on a higher earning basis so that they would not be attracted to other industries. This same viewpoint was brought out in subsequent discussions by J. B. Doan of the American Tool Works Co., Cincinnati, and other manufacturers.

J. W. Carrel of the Lodge & Shipley Machine Tool Co., Cincinnati, told of methods of developing apprentices in Cincinnati to replace losses in the working forces. Fred Eberhardt of the Gould & Eberhardt Machine Co., Newark, N. J., said his company was taking on men under the co-operative school basis.

Discuss Sales Policies

Representatives of the National Supply & Machinery Dealers' association including George Chevingtono of the Brown & Zortman Machinery Co., Pittsburg, and David A. Wright, Inc. of Chicago, were present at Thursday morning's round table and participated in the discussion of sales policies. Hope was expressed by the manufacturers that the business of buying and selling secondhand equipment be completely segregated from the new tool field and be handled by separate dealers. Other phases of the second-hand machinery market and of dealer relationships were considered. In the previous meeting the opinion had prevailed among the manufactures that the common problems of dealers and builders could be handled most effectively by committees representing each rather than by joint meetings of the general membership of the respective associations.

Mr. Carrel reported for the committee co-operating with the department of commerce. The work by the machinery division of the department in aiding the machine tool builders by furnishing information regarding export markets, credits, etc., was reviewed at length. On the subject of standardization the committee recommended that the different groups of builders study the matter of eliminating unnecessary sizes of various machines and that when a particular group is ready for definite recommendation that the assistance of W. R. Durkin of the simplified practice division of the department be listed as well as the American Engineering Standards committee. In the end it is hoped that government specifications at least will be better drawn for machine tools and finally that the approval of the Engineering Standards committee will be given to standard sizes of various lines of machine tools.

"Machine Tools: The Master Tools of Industry" was the subject of an illustrated address delivered by Prof. Dexter S. Kimball, dean of the college of engineering of Cornell university at the banquet Wednesday evening. Presdent Kearney of the association presided. Dean Kimball traced the development of various types of machine tools from their earliest origin and established a relationship between them and certain mechanical principles understood and crudely utilized by the ancients. He pointed out, however, that the greatest development in machine tools had come within the past 50 years and in that period these instruments of mechanical progress had contributed more to the ultimate ideal of universal well-being than had been accomplished in all the preceding several thousand years of civilized advancement. In its highest development, the automatic machine, the machine tool had not only accomplished the purpose of transferring the skill but also the brain of the workers, Dean Kimball said. He expressed the opinion that the advancement of the future would be the co-ordination of the automatic principle in production. Under this development automatic tools would be produced by automatic machines and the series would be carried farther and farther back in the process of manufacture. The address was illustrated by a number of slides which marked the ouotstanding steps historically in the development of the modern machine tool.

Mr. Du Brul presented the suggestion brought to his attention by other members that the association adopt as its permanent slogan, "We make the Master Tools of Industry."

At the final session the place for holding the fall meeting of the association was brought up for decision. It was voted to hold the meeting at Lennox, Mass., where the association had conducted its sessions last fall.

Problems Beset Tool Industry

Extreme Irregularity of Business Demands Special Study and Preparation To Weather Depressions—Setting Up of Contingent Burden Reserve Is Advocated—Factors of Selling Price Are Analyzed

BY E. J. KEARNEY

THE questions we should ask ourselves today are these: First—Have we learned anything from the long period of idleness? Second—What steps can be taken in preparation for the next depression?

May not the following be considered an axiomatic in answer to the first question.

First—The demand for machine tools is subject to the greatest fluctuations, even greater than that for the most useless luxuries.

Second—A continuous record plotted into a curve showing the fluctuations in volume of orders on a percentage basis, using any selected period as 100 per cent, is of the greatest value and would have saved millions in 1920.

Third—The beginning of a period of depression is the wrong time to accumulate stock.

Fourth—Price reductions have no bearing whatever on the sales of machine tools.

Fifth—Idleness costs money but is unavoidable from any knowledge that we now possess.

Sixth—The absence of substantial cash reserves with which to enter a long period of depression means price cutting, loss of self respect, discredit among our competitors, humiliating pressure from banks, expensive re-financing, creditors committees, or receiverships.

As to the second question the following may be mentioned.

A new concern, without any knowledge whatever of how to reach the user, may copy the design of an existing machine and get on the market, in good times, through the medium of the dealer. This is, in large measure, responsible for the highly competitive conditions and the low prices that usually prevail in our industry. This is especially true of tools that are simple in design, such, for example, as upright drills and shapers, but extends throughout the entire line, though in somewhat less degree. When the runaway demand comes, the dealer finds that if he can make delivery ahead of competition, orders can be taken for tools of less reputation, or no reputation as compared with the machines that he has been selling. Some dealers, therefore, approach a small shop, or an ambitious mechanic with offers to sell the entire output if only a start will be made. Equipment will be supplied on partial payments, the new product to be taken in lieu of cash. Thus a new competitor is launched with no knowledge of costs or prices except those supplied by the dealer from his scanty information.

It is surprising with what complacence this operation is viewed by the busy manufacturer when it means the division of sales effort with an inferior and cheaper tool, which has but one tendency when the peak is pased—fewer sales and lower prices for the high grade product. The manufacturer who has spent years in building up sales connections should guard them jealously.

Should Co-operate With Dealer

It would not be generous or in accord with public policy, to set about trying to prevent the development of new competition on the part of capable and experienced men but there should be more co-operation with the dealer in this regard, for the practice leads not only to weaken old established concerns, but loss, disappointment and bankruptcy to the uninformed who make a start in boom times relying on promises that cannot possibly be fulfilled.

The manufacturer who relies on a dealer should see to it that the dealer relies on him. There should be mutual confidence and close co-operation for the good of both. This policy broadly and intelligently followed will help when the next slump comes.

There is another aspect of this same question that is of vital importance, and that is the abandonment of specialization in one line at the request of some dealers who have lost out with some other manufacturer in a noncompetitive line. There are some notable concerns that are making conspicuous success in manufacturing several lines of machine tools, but it will be noticed that they have in each and every case been in these lines for many decades.

A second way in which preparation can be made for the next depression is to get in the habit of closely following the percentage curve showing in what direction the volume of new business is going, and at the first sign of a distinct downward tendency, decrease the volume going through the factory before it is too late to prevent the accumulation of a dangerously burdensome inventory, as was done in 1920.

The third item in the list of things to do in preparation for the next period of idleness is to prepare for its cost. No argument need be advanced here today, nor any details given, for the reason that our experience is all too recent. The deficit is not yet wiped out. The money that has gone and the debts that have come, both testify to the cost of idleness.

A plan was proposed, though not in complete detail, by Charles Costerlein at the Cleveland meeting, Feb. 24, 1921, which to my mind comes nearer to a solution than anything yet offered. This plan, stated in its simplest terms, provides for the calculation of burden to be applied on the production hour basis over a number of years in place of a single year. If this plan were in use, the burden profit of the good year would be carried over into the next as a burden reserve, and so designated on the books. This reserve would be carried along from year to year until the slump came, and then be applied in the payment of the cost of idleness. If, for example, five years were taken as the period, each year a new burden rate would be calculated as a moving average of the last five.

Accountants will object to the plan because it does not fit their theory or practice. It is in effect the plan used by many banks in providing a contingent reserve for bad debts.

Exactly the same principle applies to selling costs. Direct sales cost little in good years and are expensive in dull years. Selling through dealers has a tendency to average the cost, but not entirely so. Burden reserve should therefore be of two kinds—Factory and Selling.

The burden reserve accumulated in the good years would reduce the amount standing to the credit of profit, and have a tendency, when rightly viewed, to keep dividends down to a

Presidential address to National Machine Tool Builders' association at White Sulphur Springs, W. Va. Mr. Kearney is secretary and treasurer of the Kearney & Trecker Co., Milwaukee.

safe and wholesome basis, prevent over-expansion, and generally steady the industry. This method of accounting, if applied during the past five years by the concern with which I am connected, would have increased the apparent costs (the actual costs were the same in any case) over one half million dollars.

Necessary to a successful application of the foregoing is the obtaining of an adequate price during the buying period. Manifestly, the first step toward obtaining an adequate price is to ask it. Buyers are not given to paying more than the asked price.

That we are tending in the direction of one price to all without discrimination, there cannot be the slightest doubt. In fact, the number who still follow the old practice, either occasionally or habitually, is very small; but like many another minority, they attract much attention, which is exactly what they do not want..

If the assumption is correct that price cutting to one customer and selling at top prices to the trusting buyer, is no longer followed by men of intelligence and common business integrity, we can devote ourselves to a consideration of the factors that enter into the making up of adequate price lists. The selling price of machine tools depends on five principal factors.

1:—Usefulness to the Buyer.
2.—Cost.
3.—Competition.
4.—Reputation.
5.—Selling Methods.

There is an increasing tendency among us, readily discernible if you stop to consider it, to give first place to competition in establishing the price, when in reality usefulness to the buyer and cost are the main factors.

The uses to which a machine may be put are infinite in variety. For that reason a special, and perhaps exclusive feature, is of no particular value except to a certain percentage of the buyers. There is a place for the light, low priced machine where it will answer the purpose just as well, perhaps better than a heavy one of higher price. The heavy machine is striving to compete, throws away its profit on all sales, including those for which it is best adapted, by attempting to enter a field where it would not be found except as an incident, being used in part on work for which the light is ill-fitted. The same principle applies to highly developed, as against simple machines; also, to machines of high accuracy, and finish as compared with those in which these features are absent.

It is not possible for one shop to build all classes of machines in a given line as, for example, heavy and light, highly developed and simple, accurate and inaccurate, for the reason that such a mixture could not be manufactured with the same shop personnel, and the concern attempting such a program would have a reputation based on its low grade product only, and therefore would have much difficulty in marketing the higher grades. This is no reflection on the makers of less accurate machines. They have their field, but the maker of the accurate product should not attempt to reach the price of the inaccurate, nor is it necessary.

Design Should Win Reward

Our business is highly competitive, but fortunately price is not the only basis for competition. If we were making nails, for example, with the product of one factory exactly like the product of every other factory, there would be only one basis for competition—that of price. In machine tools, the real sport of the game is in design. The concern that brings out a new machine, or adds a new feature to an old one that will increase production or improve the quality of the product over that of previous standards, is performing a public service for which it should be rewarded. Overdoing design competition to the extent of making changes before a profit has been realized on the old, is just as disastrous as price competition, so far as loss of profit is concerned.

There is another subject that has been much in our minds of late, that may have a vital effect on the competition of the future, tending in the direction of price competition rather than in the direction of design and quality—that is, standardization. There are advantages both to the maker and to the user to be able to associate a given number of machines with standard ranges as furnished by all makers. Some confusion, however, arises from the practice of many builders of making more than one machine of the same number, differing in all dimensions except ranges.

There is room for progress in the matter of standardization, but it must be pointed out that the nearer together machines of different makes come in their general dimensions, the nearer together they will come in price, so that in the end we find ourselves on the defensive if we ask a few dollars more than one of our competitors making a machine carrying the same number.

From the early days of the association down to the present, we have laid great stress on the obtaining of costs. It is considered that the primary object of cost is for the purpose of using it as the major factor in determining price. In the old days we all know that the practice was to set the price not higher than that of a competitor, assuming that if he could produce a given machine for the price at which he was selling it, we could do the same.

Let us build the best machines that can be made. Build them with points of real difference. Let our product, to some degree, reflect our individuality. This does not mean adding mere talking points, but does mean differences in points of practical utility. Let us also show our individuality, courage, and confidence in our product, giving less weight to competition in making up a price list capable of providing a reserve with which to meet the next depression, and cover the cost of idleness which will then accrue.

When we meet in convention, or accidentally here and there, the topic of discussion is usually on our problems, which is perfectly natural because those things that are solved no longer give us concern. A stranger listening for the first time to our complaints would probably go away with the idea that there was no good thing about machine tools. Such, however, is far from the case. It is not a get-rich-quick route. It is something more worth while. It is the foundation of mechanical progress, and mechanical progress has been the means of adding more people to the world's population in the last hundred years than were added during the previous million. We are in it not only for the money that can be made, but for the real joy of it. Go where you will, no industrial center will be found where manufacturing is being carried on, be it cornhuskers, printing presses, automobiles, or airplanes, that does not have among its leaders and men of affairs graduates of the machine tool shops of Hartford, Worcester, and Providence. In this respect, we are performing a really valuable service in training mechanics to go out into all the world as apostles of progress.

Is this service to humanity not a service worth striving for? Are there not other things, if we had time to catalog them, that makes our industry worth while to those who follow it? Let us now and then look up and dream about adding another story to our mental workshop from which to get a wider vision of our mission of usefulness.

April Coke Production Continues Increase

Washington, May 14.—The output of by-product coke showed a slight decrease in April, according to the estimate of the geological survey. The total production for the month was 3,206,000 net tons against 3,246,000 tons in March. The fact that there was one less working day in April was responsible for the decline, and the average daily rate of production increased from 105,000 to 107,000 tons. The quantity of coke actually produced was 88.7 per cent of the capacity of the plants in operation, a percentage that compares favorably with that in preceding periods when demand for coke has been most active. Of the 70 by-product plants, 64 were active and 6 were idle.

Unlike by-product coke, the production of beehive coke increased slightly. The total output was 1,776,000 net tons, against 1,749,000 tons in March. It is of interest to note that of the total output of all coke, 64.4 per cent was contributed by by-product plants and 35.6 per cent by beehive ovens, whereas in 1920, 59.5 per cent and 40.5 per cent, respectively, were furnished by the two branches of the industry.

The present rate of porduction of all coke—4,982,000 tons—exceeds the average monthly rate in 1920 by 669,000 tons, or 15.5 per cent.

The cumulative output of beehive coke during the present year to date stands at 6,824,000 tons. Production during the corresponding period of the four years preceding was in net tons as follows:

1919	7,664,000
1920	7,744,000
1921	2,920,000
1922	2,400,000

The monthly output of by-product and beehive coke in the United States follows:

	By-product coke	Beehive coke
1917 monthly average	1,870,000	2,764,000
1918 monthly average	2,166,000	2,540,000
1919 monthly average	2,095,000	1,638,000
1920 monthly average	2,565,000	1,748,000
1921 monthly average	1,646,000	462,000
1922 monthly average	2,374,000	669,000
February, 1923	2,810,000	1,482,000
March, 1923	3,256,000	1,749,000
April, 1923	3,206,000	1,776,000

Production of beehive coke declined somewhat in the week ended May 5. Using as a basis the number of cars loaded by the principal coke carriers, the total output is estimated at 406,000 net tons. In comparison with the week preceding this was a decrease of 18,000 tons. The decline was general, and all districts with the exception of Colorado and New Mexico reported smaller production than in the week before. The weekly record of beehive output follows:

	May 5 1923	April 28 1923(a)	May 6 1922
Colorado and New Mexico	10,000	9,000	3,000
Pennsylvania and Ohio	328,000	338,000	70,000
West Virginia	23,000	27,000	7,000
Alabama, Kentucky, Tennessee and Georgia	24,000	26,000	7,000
Virginia	16,000	18,000	6,000
Washington and Utah	5,000	6,000	2,000
United States total	406,000	424,000	95,000
Daily average	68,000	71,000	16,000

(a) Revised from last report

Merger of Auto Frame Builders Completed

In the completion of the merger of the Detroit Steel Products Co., Detroit, and the Parish & Bingham Corp., Cleveland, under the name of the Midland Steel Products Co., with a capital of $10,000,000, the largest manufacturers of automobile frames in the United States are brought together. According to Carl H. L. Flinterman, vice president and general manager of the new company no change of policy or plans for expansion will be considered. The wheel division of the Detroit Steel Products Co., was not inculded in the merger, this division having been transferred to the Motor Wheel Corp., Lansing, Mich., recently. Officers of the Midland Steel Products Co., are: President, Edward J. Kulas, Cleveland; vice president and general manger, Carl H. L. Flinterman, Detroit; secretary, Gordon Stoner, Cleveland; treasurer, Ralph H. Clark, Cleveland. Directors include George A. Coulton, Frank Ginn and E. J. Kulas, Cleveland; Carl H. L. Flinterman and Frank Tillotson, both of Detroit and F. Ward Paine, Boston.

The new company will have a capital of $10,000,000 composed of $2,500,000 of 7 per cent first mortgage bonds running 15 years; $7,000,000 of 8 per cent participating cumulative preferred stock and 50,000 shares of common stock of no par value.

Cement Output Larger

Washington, May 15.—Portland cement production in the United States in April totaled 11,322,000 barrels, compared with 9,880,000 in March and 9,243,000 in April, 1922, states the federal geological survey. April shipments amounted to 12,917,000 barrels, against 10,326,000 in March and 8,592,000 in last April. On April 30 stocks were 11,450,000 barrels; on March 31 they were 13,045,000 and on last April 30, 14,470,000.

The Bryant Electric Co., Bridgeport, Conn., has increased its capital stock from $2,000,000 to $3,000,000.

Motorcar Industry

At Detroit Shows No Indication Of Slowing Down

Detroit, May 15.—There is no indications of any slowing down in production by the leading automobile companies and accessory manufacturers in this territory is apparent. A casual survey of the industry indicates that the peak in production has not been reached, and it is not likely to be reached for several months, judging from orders on companies' books yet to be filled.

Representative of iron and steel makers in this district declare that thus far they have not seen any evidence of slowing down among manufacturers of automobile parts such as customary before the assembly plants curtail production. The pessimistic reports which have been broadcasted recently are based mainly on the action of the automotive industry in former years when business was transacted on a basis more consistent with that of prewar days, bankers and brokers assert.

Bankers in this section assert that practically all the plants which weathered the last depression have reaped great wealth from the intensive production and sales since last fall. Most of them now have liberal surplus accounts on which to draw for cash for improvements and other needs, without appealing to financial institutions.

Steel mill representatives say there is no scramble for material for the third quarter from the automotive industry as yet, although there is a good inquiry for tonnage and prices. Some tonnages of sheets for that period are being sold at current quotations. Bars also are being taken at prices ranging from 2.40c up, according to specifications and size of the order.

According to reliable sources, two large automobile plants which had arranged to reduce production schedules for July and August since have discarded the plans and placed their production schedules back to their previous high rates owing to additional sales. One of the largest automobile companies announced to bankers here this week that orders on its books continue to grow, and despite increased production, could not take care of business at hand. The peak of production for this company is forecasted for September.

The Ford Motor Co., established a new high record in production for the week ended May 8, when 39,053 motor cars and trucks were produced for domestic use. This is a gain of 192

over the last previous high mark. On May 8 6990 cars and trucks were produced, a new high record for one day, representing a gain of 17 over the previous mark. For the week ended May 3 2578 tractors were produced and 176 Lincoln cars finished.

Tool Exports of United Kingdom Decline in 1921

Exports of machine tools from the United Kingdom in 1921 were valued at $11,113,822, according to a bulletin just issued by the United States department of commerce, bureau of foreign and domestic commerce. This is a decrease of 14 per cent as compared with those of 1920.

The figures show 1764 drilling machines valued at £379,524 were exported during 1921 compared with 3227 valued at £491,036 in 1920; grinding machines, 682 valued at £136,657 which compares with 1092 valued at £135,961 in the preceding year; milling machines, 625 valued at £183,066 compared with 740 valued at £242,552; planing and shaping machines, 608 valued at £298,399, which compares with 701 valued at £326,400; presses, punches and shears, 527 valued at £225,193 compared with 683 valued at £191,133; all other metalworking machinery, 2181 valued at £689,181 compared with 2420 valued at £624,284; lathes 2779 valued at £975,395, compared with 9144 valued at £1,344,996 in 1920.

Japan was the largest buyer of drilling machines, taking 156 during the year. Belgium was the largest buyer of grinding machines, taking 42; Japan purchased 197 lathes, being the largest individual buyer of this class of tool; France of milling machines, taking 25, and also of planing and shaping machines, taking 30; France also was the largest buyer of presses, punches and shearing machinery, taking 72, while Japan took 175 unclassified tools, being the largest buyer of this class.

Exports of machinery to British India were the largest, being valued at £780,566, while other large buyers were Australia with £355,883, Japan with £301,676; France with £215,446; Belgium with £185,412 and the Union of South Africa with £141,052. Exports to the United States during the year were valued at but £5759 which compares with £18,413 in 1920 and £4422 in 1913.

Final figures for 1922 are not yet available, but preliminary statistics show that during that year total machinery exports were valued at £1,530,811, which is a decrease of 14 per cent as compared with those of 1921, and a decrease of 54 per cent as compared with those of 1920, the peak year.

Obituaries

GEORGE HENRY BEAUMONT, one of the most widely known experts on iron ore and blast furnace practice in the country, died May 12 at Palm Springs, Cal. Practically all of Mr. Beaumont's experience was obtained through his association with the firm of Pickands, Mather & Co., Cleveland. He began work for the firm 30 years ago as a clerk and won promotion through various departments, becoming a member of the firm in 1916. His work was devoted largely to the iron ore division of the business. Mr. Beaumont was 60 years old, and was in ill health for more than a year. He was a member of a number of business organizations and social clubs.

Henry Woodland, since 1901 secretary-treasurer of the Allis Chalmers Mfg. Co., Milwaukee, died suddenly May 14.

William Brady, chief chemist for the Illinois Steel Co., Chicago, and prominent as a steel chemist, died recently. He was a graduate of Purdue university.

William Shreve Doran, a marine engineer and president of the Alberger Pump & Condenser Co., New York, died in that city, May 12.

Daniel W. Voorhees, president and general manager of the Peru Plow & Wheel Co., Peru, Ill., died in that city May 7, from influenza. He was well known in the agricultural implement industry and the iron and steel trade.

James Whitehead Wilson, 64 years old, vice president of the Detroit Lead Pipe Works, Detroit, with which he was associated for 40 years, died at his home there May 9 after several months illness. He was born in Glasgow, Scotland.

John Everett Rogers, secretary of the Rogers Drop Forging Co., Worcester, Mass., and also of A. Hankey & Co., Inc., Rochdale, Mass., died in a Worcester hospital, May 7, aged 29 years. Mr. Rogers, who was a graduate of Harvard university, was the founder of Worcester chapter, American Society of Steel Treaters.

Walter Samuel Alley, for 25 years well known as a pig iron and coke salesman in the New York territory, died May 13, at his home in New York. Mr. Alley was 48 years old. All of Mr. Alley's business career was associated with Alley & Page and that firm's predessors. He originally went to work with J. L. Peirson & Co., which later was succeeded by J. Brooks Fenno & Co. The latter concern later was succeeded by Alley & Page.

Thomas H. Simpson, president and treasurer of the Michigan Malleable Iron Co., Detroit, and of the Michigan Sprocket Chain Co. died at his home in Detroit May 9 after a year's illness. He was widely known in the iron and steel industry. Until his health failed more than a year ago he traveled extensively in foreign countries, including the Orient. Mr. Simpson was born in McConnellsville, O., 64 years ago, and came to Detroit 40 years ago, engaging in the manufacture of iron and steel products.

Thomas Nicholson, Jr., aged 82, a member of the firm of Nicholson & Co., Pittsburgh, manufacturers of chain, died May 7 at his home in Swissvale, Pa., after an illness of two years. Mr. Nicholson was born in Philadelphia, and had resided in Swissvale more than 25 years. He was graduated from Lehigh university as a mechanical engineer with the class of 1883. About 1898 he and his brother, David K. Nicholson, Pittsburgh, organized the Pittsburgh Chain Works, trading under the firm name of Nicholson & Co., which company purchased a site at Hawkins Station in Rankin.

Plan Large Extension

Tentative plans of the Central Steel Co., Massillon for additional plant equipment to the value of between $5,000,000 and $10,000,000 involving ultimate employment of between 2000 and 3000 more workmen, have been announced by Clarence G. Herbruck counsel. Attorney Herbruck's statement was coupled with an explanation of factors which may defeat the proposed improvements, with respect to Massillon and which possibly may affect ultimately the Central Company's present plant investment at Columbia Heights. Proposed additions include a blast furnace, by-product coke oven and auxiliary plants.

According to the statement the proposition hinges on action of the Massillon city council in withdrawing from the Stark county commissioners a petition that Columbia Heights be annexed to the city of Massillon. The annexation would increase the Central Steel Co.'s taxes around $7000 annually.

Car Shortage

And Labor Situation Hinders Prompt Shipments of Refractories

Pittsburgh, May 15.—Intermittent car shortages as well as a more or less sustained labor shortage in many directions are hampering shipments of refractories to a large extent. In some plants shipping dates are several weeks deferred. Transportation companies, however, are making improvements in car placements so that deliveries are becoming more regular. The labor problem, however, is becoming increasingly difficult to solve. Present buying appears to be limited to repair needs, comprising chiefly 200,000 or 300,000 brick at a time. New construction brick needs have practically all been taken care of for the time being although a few projects such as new open hearths in the Girard, O., district, and new blast furnaces in Illinois and Ohio, are expected to develop some large fire clay and silica brick orders. New construction, is now a trifle less urgent than it was two months ago. Practically all large consumers of brick are fully covered until July 1 and are not interested as yet in requirements beyond that date. They are, however, furnishing shipping instructions or specifications on their contracts with a fair degree of regularity. Kiln operations remain on approximately an 80 per cent basis and prices are unchanged. Fire clay brick in Pennsylvania still is quoted at $48 to $51 and silica at $46 to $47, although several buyers say they are able to purchase certain limited quantities at lower figures than quoted. An inquiry for 25 000 magnesite brick is current on which the $65 price has been quoted. Chrome brick activity, however, is confined to shipments on contracts, practically all consumers having bought for two or three months expiring July 1. The price on chrome brick still is $50.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	48.00 to 51.00
Pennsylvania, No. 2	43.00 to 46.00
Ohio, No. 1	45.00 to 47.00
Ohio, No. 2	40.00 to 43.00
Illinois, No. 1	48.00 to 50.00
Illinois, No. 2	45.00 to 47.00
Kentucky, No. 1	45.00 to 48.00
Kentucky, No. 2	40.00 to 42.00
Missouri, No. 1	50.00 to 52.00
Missouri, No. 2	40.00 to 42.00
Maryland, No. 1	50.00 to 53.00
Maryland, No. 2	44.00 to 45.00

SILICA BRICK

Pennsylvania	$46.00 to 47.00
Chicago	52.00 to 54.00
Birmingham	48.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Otis Steel Profits Gain

The Otis Steel Co., Cleveland, reports net profits for the three months ended March 31, 1923, of $248,959, after taxes and interest, but before depreciation. This compares with a deficit of $365,183 for the first three months of last year. The comparative income account for the first quarter follows:

	1923	1922
Manufacturing profit	$631,942	$37,077
Expenses, taxes, etc.	241,487	237,600
Operating profit	390,455	*200,523
Other income	29,456	29,103
Total income	419,911	*171,420
Interest, discounts, etc.	147,776	139,622
Sub. cos. reserve	23,176	54,146
Net profit before depreciation	248,959	*365,188

*Loss.

United Alloy Sales Up

Gross sales of $12,677,123, against $5,360,498 in the same period last year are reported by the United Alloy Steel Corp., Canton, O. After allowing for all expenses, but before reserves for depreciation and taxes, there was reported net income of $1,385,678, against $540,898 in 1922. After allowing for taxes and depreciation, there was reported a balance of $884,388.

Made Institute Director

William J. Filbert has been elected a director of the American Iron and Steel institute. Mr. Filbert is comptroller, a member of the finance committee and a member of the board of directors of the United States Steel Corp. He is also treasurer of the American Iron and Steel institute. The following directors, whose terms expired in 1923, have been re-elected for three years; E. H. Gary, James A. Farrell, L. E. Bloch, A. C. Dinkey, Robert Hobson, W. S. McCook and C. M. Schwab. The directors have taken action which will result, after the filing of a legal notice, in increasing the number of directors from 21 to 24.

Prepares Gasket Data

Through omission the articles, "Care Should Be Used in Installing Gaskets," appearing on page 1392 of the May 10 issue of IRON TRADE REVIEW was published without proper credit to the authors. The material, which is copyrighted, 1923 was submitted by the Flexitallic Gasket Co., Camden, N. J. All rights are reserved for use of the information in a forthcoming book on gaskets.

Contract Season

For Sulphate of Ammonia Now Is Well Under Way

New York, May 15.—The contracting season in the sulphate of ammonia market is getting well under way, with fertilizer manufacturers buying at around $3, f.o.b. northern plants and $3.05 to $3.10, southern plants. Spot demand continues light, with the market unchanged at $3.20 to $3.25 works, on domestic and $3.60 to $3.65 ports, in double bags on foreign. This latter range represents a concession of about 5 points from the range of the market as quoted.

Activity in ball and flake naphthalene continues to be regarded by continued cool weather. The cleaning season, as a result of weather conditions is slow in getting under way, and as a result, the drug trade is buying lightly. However, with supplies still relatively scarce, the market continues strong at 10 cents works for flakes and 11 cents for balls in carload lots, and one cent higher on less carload lots.

Light oil distillates continue unchanged at 30 cents works in tanks and 35 cents in drums for pure benzol; 27 cents in tanks and 32 cents in drums for 90 per cent benzol; 30 cents in tanks and 35 cents in drums for toluol; 27 cents in tanks and 32 cents in drums for solvent naphtha, and 29 cents in tanks to 34 cents in drums; for commercial xylol; shortage of tank cars and drums continues. Supplies at the works, however, are sufficient to meet all needs, particularly benzol and toluol. In solvent naptha, a scarcity is noted, but is not acute.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.20 to 3.25

Contract

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene flake	0.10
Naphthalene balls	0.11

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

OLIVER W. LOOMIS, formerly manager of sales for the National Malleable Castings Co., Cleveland, has been transferred to Chicago, where he has been placed in charge of the company's largest manufacturing group, as manager of the three plants located in that city. Mr. Loomis started his career with the company March 1 1891, as shipping clerk and rose through various office positions until he became cashier of the Cleveland works. He than was transferred to the manufacturing department and later to the sales department where he was placed in charge of the railway sales. He finally became manager of sales including both railway and miscellaneous sales.

O. J. Fehling, manager of the Chicago plants of the company has resigned to retire from active business. He started with the company as an office boy in 1884 and progressed to the position of works director in October 1905 and manager seven years later. He was tendered a farewell banquet by his associates at the LaSalle hotel.

C. T. Lonney, treasurer of the Cleveland works of the company, has been transferred to the treasurer's department, general offices, Cleveland, for special work. He has been succeeded as Cleveland treasurer by Robert A. Benson.

James A. Slater has been named manager of sales succeeding Mr. Loomis, and Charles W. Erkert, of the general accounting department, has been made cashier of the Toledo works, succeeding George A. Logan, resigned.

A. T. Hinckley, of the National Carbon Co., Niagara Falls, N. Y., recently was elected president of the American Electrochemical society.

John B. DeWolf, Philadelphia district sales manager of the Trumbull Steel Co., Youngstown, O., recently was awarded the golf championship cup of the Steel club of Philadelphia.

W. D. Creider, for some time connected with the Federal Machinery Sales Co. at Milwaukee, has been made sales manager of the Oil Gear Co., Milwaukee.

Harry Collinson has been appointed district manager in charge of the Milwaukee office and warehouse of the Carborundum Co., Niagara Falls, N. Y. He succeeds J. H. Jackson, resigned. Mr. Collinson has represented the Carborundum Co. in Ontario and he has been succeeded in that vicinty by C. E. Brown, lately of the sales department

OLIVER W. LOOMIS

of Norman MacDonald, agent for the Carborundum Co. at Toronto, Ont.

Edward L. Wetstein has been appointed manager of sales for the Michigan Steel Corp., Detroit. For the past 15 years he has been associated with the American Sheet & Tin Plate Co., in the Pittsburgh and Detroit offices.

Craig Geddis has been appointed assistant sales manager of the Monongahela Tube Co., Pittsburgh, in its ingot iron department. For the past five years Mr Geddis has been developing and extending the sale of this material, particularly among the oil refiners and producers.

L. Weimer Murray, sales manager for the General Refractories Co., Chicago, has associated with him P. C. Leonard and G. S. Kennelley, both formerly with the American Refractories Co., which as of May 1, has been acquired by the General company.

George E. King, formerly representing Fitzsimmons & Co. and the Pittsburgh Steel Products Co. at Buffalo, under the firm name of George E. King & Co., has been made western manager for Denton & Anderson, representatives for the Ohio Seamless Tube Co. with offices at 1150 Peoples Gas building, Chicago.

Rawson Collier, until recently general sales manager of the Central Hudson Gas & Electric Co., has joined the organization of Dwight P. Robinson & Co., Inc., New York. For five years Mr. Collier was a member of the firm of Collier & Brown, Atlanta, Ga., consulting engineers, leaving that firm to become connected with the Georgia Railway & Electric Co.

Dr. T. T. Read, who has meen supervising mining engineer of the bureau of mines, department of the interior, at Washington, on May 1, became superintendent of the north central mining experiment station of the bureau at Minneapolis. Dr. Reed will have general charge of the mining investigations of the Lake Superior district.

O. C. White, for the past two years Ft. Worth, Tex., manager for the Youngstown Boiler & Tank Co., Youngstown, O., recently was appointed general manager of sales for the company with headquarters in Youngstown. He has been succeeded at Ft. Worth by A. L. Scudder formerly district sales manager in that city for the Graver Corp.

H. E. Witham has been appointed representative of the Kearney & Trecker Co., Milwaukee, at Chicago, suceeding W. H. Allen who has been promoted to sales manager with headquarters in Milwaukee. Mr. Witham has been connected with the Warner & Swasey Co., Cleveland, being its western representative during the past eight years.

George W. Niedringhaus, president

of the National Enameling & Stamping Co., St. Louis, has been elected a director of the Missouri Pacific railroad succeeding H. L. Utter, secretary of the board.

David S. Drysdale has been made superintendent of the company.

F. M. Winter, member of the firm of H. P. Winter & Co., New York, metal brokers, is spending several months abroad.

W. L. Proctor, proprietor of Buck Bros., Millbury, Mass., makers of edge tools, sails this week for a two months' vacation trip to England.

Donald Tulloch, secretary of the Worcester, Mass., branch of the National Metal Trades association, has returned from a three months' trip to Scotland and England.

Earl R. Frost was elected president of the National Machinery Co., Tiffin, O., succeeding the late Meshech Frost, his father. He also was reappointed general manager of the company.

Fowler Manning, formerly director of sales for the Diamond Match Co., New York, has been named director of sales for the Hoover Suction Sweeper Co., North Canton, O.

John E. White, president of the Graton & Knight Mfg. Co., Worcester, Mass., has been elected a director of the New England Steamship Co., a subsidiary of the New York, New Haven & Hartford railroad.

Ernest W. Berggren, research engineer connected with the Worcester, Mass., district of the American Steel & Wire Co., will sail from New York, May 31, for a three months' trip through Europe.

F. J. Kelley, sales manager of the New Home Sewing Machine Co., Orange, Mass., has been appointed by Charles N. Stoddard, receiver, Greenfield, Mass., to act as his assistant in the reorganization of the business, serving as manager in charge. He also will continue as sales manager.

George C. Bestick, purchasing agent of the Heald Machine Co., Worcester, Mass., has been elected a director of the National Association of Purchasing Agents representing the New England Purcahsing Agents' association, of which he has just retired as president.

R. J. Cooper has been appointed representative in California with offices in the Monadnock block, San Francisco, for the Pittsburgh Valve Foundry & Construction Co., Pittsburgh. Robert M. Spurlock has been appointed district sales manager for the company in the Louisiana territory, with headquarters in Shreveport, La., and J. B. Purser district sales representative in the Charlotte, N. C., territory.

J. Verner Critchley, president of Walden-Worcester, Inc., and managing director of the Coppus Engineering Corp., Worcester, Mass., has been elected president of the Reed-Prentice Co., that city, succeeding Arthur H. Wood, Boston, who remains on the board of directors.

E. H. Shepard has been appointed general sales manager of the Holley Carburetor Co., Detroit. Previously Mr. Shepard was connected with the Stromberg Motor Devices Co. for more than 12 years, the last five as manager of the Detroit branch of the company.

Frank M. Ryan, formerly production engineer of the Hamilton, Ont., plant of the Norton Co., Worcester, Mass., will sail about July 1 to join the French plant of the company in La Courneuve, near Paris. Nils Ebbeson and Harold Dunbar, who have been connected with the French plant, have returned to Worcester.

P. L. Howenstine has been elected to the board of directors of the Superior Sheet Steel Co., Canton, O., at the annual meeting of the company to succeed the late Harry S. Renkert. At the same time he was made treasurer of the company. Mr. Howenstine was one of the original incorporators of the company and held the positions of assistant treasurer and purchasing agent.

List Exports by Countries

Increasing trade activity with Japan featured the United States exports in iron and steel during February, according to figures compiled by the iron and steel division of the department of commerce, Washington. That country received 18,283 tons in February as compared with the 9964 tons during the month preceding. Shipments to Canada, Cuba and Mexico fell off slightly in February. Principal countries to which the United States exported iron and steel in February and the tonnage follows: Canada 55,404 tons, Japan 18,283 tons, Cuba 7659 tons, Mexico 6067 tons, Argentine 5556 tons, United Kingdom 5009 tons, Australia 4004 tons, British India 4114 tons, Brazil 4201 tons, China 2973 tons, Honduras 2587 tons, Colombia 2567 tons, Peru 1971 tons, Philippine Islands 1944 tons, Hongkong 1402 tons, and Chile 1310 tons.

The Heeden Motor Co. has bought the plant of the Bucyrus Machine Tool Co., Bucyrus, O. Plans of the company have not been made known.

April Ingot Production at Higher Rate

Production of steel ingots in the United States during April was at a somewhat higher rate than reported in the May 10 issue of IRON TRADE REVIEW. The revision upward is necessitated by a change in the proportion of output to the total production for the country, represented by the 30 companies reporting to the American Iron and Steel institute. During 1921 the 30 companies produced 87.5 per cent of the total, consequently that figure was used as the basis of calculations in monthly reports throughout the greater part of 1922 and the first three months of 1923. As a result of more recent production figures compiled by the institute, it was found that during 1922 the 30 companies made only 84.13 per cent of the total for the country.

On the basis of 25 working days in April and a total production of 3,321,278 tons, the 30 companies produced an average of 132,851 tons per day. As compared with the daily rate of 126,000 tons in March. Using the new factor of 84.13, the output for the whole country in April was at the rate of 157,911 tons per day against the March rate of 144,000 tons and was the highest in history.

Based upon the average daily output of April and 311 working days per year, the annual rate of production for the 30 companies during the month was approximately 41,315,000 tons and about 2,125,000 tons more than the 39,190,000-ton rate of March. Similarily, the approximate annual rate for the whole country in April was 49,110,000 tons, against the rate of 44,780,000 tons in March.

Though official ingot production figures for 1922 have not been announced by the American Iron and Steel institute, an approximation now is easy to obtain. During the year the 30 companies made 29,116,453 gross tons of ingots. Since this represented 84.13 per cent of the total the production for the entire country was approximately 34,600,000 tons. This tonnage was but slightly better than the total for 1919 of 33,694,795 tons. Production for the first four months of 1923 amounts to approximately 15,310,000 tons, or at annual rate of nearly 46,000,000 tons. The output for the corresponding period last year was 9,690,000 tons.

Approval of a plan for the refinancing of the defunct Defiance Machine Works is sought in federal court at Toledo by Receiver E. M. Hummer. The plan is to issue $600,000 worth of 10-year first mortgage 6 per cent bonds.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE plant of the Zeigler Mfg. Co., Alexandria, Ind., manufacturer of hangings and machine products has been bought from Joseph Zeigler of Anderson, by a group of Terre Haute, Indianapolis and Wheeling business men. The plant is being taken over by the Zeigler Mfg. Co. an Indiana corporation formed in 1921, but never made active, by Joseph Zeigler, who owned the factory. The following board of directors of the new company has been elected: Henry K. Dalzell, secretary and a director of Columbian Enameling & Stamping Co.; Andrew Nelson, general superintendent of the Columbian Enameling & Stamping Co., and W. J. Freeman, coal operator, all of Terre Haute; A. W. Paull, manufacturer of Wheeling, and Fred Millis, president of the Millis Advertising Co. of Indianapolis. The officers are Mr. Dalzell, president, and Mr. Millis, secretary-treasurer. Mr. Nelson will be manager.

* * *

THE Instant Electric Water Heater Co., Bridgeport, Conn., formerly the Bridgeport Machine & Tool Co., has leased a plant in that city, where it will make a device invented by the late Andrew P. Nichols, Bridgeport. H. E. Dineson is president of the company which is capitalized at $250,000.

* * *

UPON the completion of a factory addition doubling the capacity of the four-cylinder car division at Milwaukee, the Nash Motors Co. is starting work on another building, 125 x 250 feet, which will be used as a final checking shop, from which cars will be loaded for shipment. It will cost about $75,000. The steel work has been let to the Lakeside Bridge & Steel Co., Milwaukee.

* * *

THE National Tube Co. has obtained the former Davis property in Forbes street, Pittsburgh, adjoining the bureau of mines, as a site for research laboratory and has disposed of its lot in O'Hara street, previously acquired as a laboratory site. The property obtained by the company has a frontage of 149 feet in Forbes street. It is irregular in depth, one side of the lot being 223 feet and the other side 91 feet. The rear line is 200 feet on a diagonal line.

* * *

THE Taplin-Rice Clerkin Co., Akron, O., following the recent fire at its North Akron plant expects to be back on a 100 per cent production basis in four months. The company is working on plans for a new foundry building to be completed soon. The new building is expected to be 50 per cent larger than the one destroyed and will involve an expenditure of $150,000.

* * *

THE Wisconsin Automotive Corp. is the new name selected by the U. S. Tractor & Machinery Co. of Menasha, Wis., which is going into the manufacture of automobiles in addition to tractors. Within 30 days the changes in several departments will be completed and production started. New engineering and designing talent was engaged several months ago for this purpose and since then some new tools and other machinery have been ordered.

* * *

A NEW copper and brass wire mill, 200 x 600 feet, will be erected as an addition to the Kenosha, Wis., works of the American Brass Co., it is announced. Contracts for the structural steel have been let to the American Bridge Co., and J. C. Tully, Kenosha, will have charge of other portions of the construction work. Ground was broken May 1 and will be pushed so that the mill will be ready to receive equipment after June 5 and be ready to make wire July 1.

* * *

REORGANIZATION of the personnel of the management of the P. B. Yates Machine Co., Beloit, Wis., and Hamilton, Ont., has been made following the probating of the will of Porter B. Yates, founder, president and chief owner of the company. H. A. Vanoven, president of the Beloit State Bank, F. L. Lane and L. M. Randall, officers of the Yates company, were named executors and trustees of a trust estate for the benefit of the only heir, a 15-year-old daughter. Mr. Vanoven has been elected president; F. L. Lane, vice president; L. M. Randall, treasurer, and Frank R. Smith, secretary. The estate is appraised at $1,900,000. The Yates company is a large manufacturer of woodworking machinery and tools.

* * *

THE Westco Pump Co., Davenport, Iowa, has purchased the Chippewa Pump Co., Chippewa Falls, Wis. The Westco company has specialized in shallow well pumps, whereas the Chippewa plant turns out deep well pumps. The consolidation gives the new company a wider range of products.

* * *

THE Mulvey Iron Works, 1840 Carroll avenue, Chicago, has purchased a site at California avenue and the Northwestern railroad, on which the first unit of a new structural steel fabricating plant with 20,000 square feet of floor space will be started immediately. A second unit will be erected next year.

* * *

PATENTS will be applied for to protect a new design of storage warehouse which the A. O. Smith Corp. is building in connection with its main works in Milwaukee to store automobile frames with a minimum requirement of space and waste in labor. The building is of steel construction and will hold 60,000 frames at one time. It will have a system of bins, shelves and other receptacles, served by a monorail system and hoists, and will be connected with the pressed steel shop at one end and the shipping room on the other.

* * *

THE Equipment Specialties Co., Chicago, has been organized to manufacture and sell specialties for railway cars and will be located at 166 West Jackson boulevard. L. L. Cohen is president, George A. Hull vice president, W. R. Gillies secretary, and C. Mosier treasurer. Mr. Hull will be actively in charge of the company.

* * *

THE power plant to be erected north of Toronto, O., will be constructed for the Pennsylvania-Ohio Electric Co., a subsidiary of the Republic Railway & Light Co., New York city. Construction costs, it is estimated, will aggregate $6,000,000,

and approximately $1,000,000 will be spent for transmission lines.

* * *

FRED H. BARKER, Harlan C. Davis and Russell B. Davis, all of Leominster, Mass., have formed a partnership under the name of Barker & Davis to operate a machine shop in that city. It is expected the firm will specialize in the building of machinery used in the celluloid industry.

* * *

THE new foundry of Campbell, Wyant & Cannon Foundry Co., Detroit, has been placed in operation at 100 tons daily. It is planned to advance this production to 200 tons daily, as the company has a large contract for castings from the Durant Motor Co. on hand.

* * *

TWO large scrap metal companies in Milwaukee have joined forces in a new corporation named Grossman Bros.-Parelskin-Groden, Inc., with headquarters at 240-260 Madison street, the headquarters of Grossman Bros. Co. Sam Parelskin, doing business at 160 Reed street, is the new interest.

* * *

THE Hanna Stoker Co., Cleveland, manufacturer of locomotive stokers, has acquired a 2½-acre tract, along the Pennsylvania railroad in Madisonville, a suburb of Cincinnati. A factoy bulding to cost $60,000 will be built on the site by the Austin Co., Cleveland.

* * *

THE Newark Malleable Iron Works, Newark, N. J., has completed a wing, 100 x 125-feet on the end of its malleable iron foundry. The addition has been equipped with three sand blast barrels, a 15-ton furnace and other equipment and the addition will approximately double the melting capacity of the organization.

* * *

THE Pittsburgh Piping & Equipment Co., Pittsburgh, has bought from Charles R. Rall, and from the D. H. Mangan estate, two properties adjoining its plant in Charlotte street, near Thirty-third street, Sixth ward, this city. Plans of the company for the use of the site have not been announced.

* * *

A MACHINE shop, for servicing mill and plant equipment, locomotives, etc., will be built at Park Falls, Wis., by the Flambeau Paper Co., at a cost of $150,000. C. R. Meyer & Son Co., Oshkosh, Wis., have the general contract. Architects Brust & Phillipp, 405 Broadway, Milwaukee, are supervising the work.

* * *

THE Detroit Steel Products Co., Detroit, makers of automotive and railway springs and other iron and steel products, will establish a branch factory at Emeryville, Cal., according to V. F. Dewey, president. The new branch will have 83,000 square feet of space. Burleigh A. Lum has been appointed manager of the plant and will have charge of sales on the Pacific Coast.

* * *

THE Blake & Johnson Co., Waterbury, Conn., has announced the acquisition of the patents, patterns and drawings of all rolling mill machinery of the Sundh Engineering & Machine Co., Philadelphia, and has combined it with its own line of rolling mills, slitters, etc. Acquisition of this line puts the Blake company in a position to offer a considerable range of apparatus.

* * *

STOCKHOLDERS of the Charcoal Iron Co., of America' Detroit, at the annual meeting of the company, re-elected these directors: A. H. Green Jr., Frank W. Blair, H. M. Campbell, F. T. Moran, J. W. Drake, A. A. Fowler, F. C. McMath, H. L. Harker, Mrs. C. B. Sherrard, C. H. Havill, Herman Kunert. The directors elected these officers: President and general manager, A. H. Green Jr.; vice president, secretary and treasurer, C. H. Havill; vice president, Herman Kunert.

* * *

THE Skinner Chuck Co., New Britain, Conn., has bought from the Production Tool Equipment Co., Bridgeport, Conn., all the dies, patterns, fixtures, machinery, etc., for the production of a vise formerly produced by the Production company. This tool is particularly adapated for use on milling and drilling machines. The company plans to develop a complete line of milling machine vises with and without swivel bases.

* * *

PRELIMINARY contracts have been let by the Johnson Service Co., Milwaukee, for an addition which will double the size of its plant at Michigan and Jefferson streets. This will be 7-stories, 62 x 90 feet, and duplicate the present building. The company manufactures automatic heat regulation systems, time clocks, and does a large brass casting business. H. W. Ellis is president and general manager.

* * *

FREYN, BRASSERT & CO., Chicago, have been awarded contracts by the Donner Steel Co., Buffalo, for the installation of two gas washers, together with thickener and equipment for the recovery of flue dust carried in the discharge water. The company also has been awarded a contract by the National Tube Co., Pittsburgh, for the installation of a thickener and equipment for sludge disposal at its National works.

* * *

THE Canton Bolt Co., Canton, O., which has been incorporated will begin operations in three weeks accord to Gilbert Canterbury one of the incorporators. The company has taken over the factory formerly occupied by the Standard Parts Co. It will manufacture a complete line of bolts and rivets. Machinery and necessary equipment will be installed and will be modern in every respect. A meeting of the board of directors of the new company will be held soon, when officers will be elected.

* * *

FOR the purpose of increasing its facilities to better handle its volume of business, the Ouachita Iron Works, Inc., Monroe, La., recently was incorporated with a capital stock of $40,000. The company now is erecting a new plant building and is adding a foundry which will enable it to produce gray iron and brass castings. Officers of the company are: President and general manager, M. W. Anthony; secretary and treasurer, L. J. Anthony and vice president, J. B. Anthony.

* * *

THE Masashino railway of Japan has placed an order with the Westinghouse Electric & Mfg. Co., through Takata & Co., for three electric locomotives, two motor car equipments and two trailer car equipments. The Masashino railway will operate these new equipments from Ikebukuro, about 10 miles northwest of Tokio, west to Han-no, a distance of 27½ miles. This road is a narrow gage system operating on 1200-volts direct current drawn from an overhead trolley wire.

* * *

THE annual stockholders meeting of the Savage Mountain Fire Brick Co,. was held at the company's offices in Frostburg, Md., recently. Directors were elected as follows: John A. Caldwell, H. G. Caldwell, W. F. Caldwell, G. A. Shuckhart, and Clarence Overend. At the directors' meeting the following officers were elected: John A. Caldwell, president and treasurer; H. G. Caldwell, vice president; W. F. Caldwell, secretary; G. A. Shuckhart, superintendent, and G. R. Harvey, assistant secretary.

March Steel Exports Are Higher

Volume of Shipments Abroad During Month Exceeds Previous Month's Total by 31,323 Tons—First Three Months' Exports Total 439,810 Tons—Fair Tonnage of Ferromanganese Sent Out

EXPORTS of iron and steel during March totaled 168,176 gross tons, according to figures just made available by the United States department of commerce, bureau of foreign and domestic commerce. This is a gain of approximately 31,323 gross tons as compared with the preceding month but is a loss of 42,066 tons against the corresponding period of 1922. The daily average of exports during March was 5425 gross tons, compared with 4887 tons, in February.

The total quantity of iron and steel shipped abroad during the first three months of the year is 439,510 gross tons, which compares with 541,367 tons exported in the same period of 1922. During the three months period exports of rails have been the heaviest, the total being 57,093 gross tons. This is less however, than the 69,569 gross tons exported during the same period of 1922. Iron and steel bar exports also were heavy, the total shipments of this material during the first three months of the year being 46,164 tons. This represents a gain as compared with 35,167 in 1922.

Compared with exports in the preceding month, shipments in March showed considerable improvement. Gains were registered for pig iron; scrap; semifinished material; alloy steel bars; wire rods; plates; galvanized sheets; black steel sheets; tin and terne plate; plain structural shapes; tank plates; structural forms; metal lath; rails; rail joints; welded galvanized pipe; cast iron pipe and fittings; galvanized and barbed wire; bolts, nuts and rivets; insulated wire and cable; other wire; cut nails and horeshoe nails; ferrosilicon and ferromanganese. Losses were recorded for iron bars; boiler plate; black iron sheets; fabricated structural shapes; switches frogs, etc; boiler tubes; malleable iron pipe fittings; plain wire; wire cloth and screening; wire rope and cable; wire nails and horseshoes. A number of items on the list practically held stationary in volume exported as compared with the preceding month. These were steel bars; hoops and bands; railroad spikes; casing and oil line pipe; welded black pipe and woven wire fencing.

Castings and forgings exports during March totaled 3235 gross tons compared with 2726 tons in February and 2995 tons in March 1922. Exports of castings during the first three months of the year totaled 7769 gross tons, against 8109 tons in the same period of 1922. Compared with February figures individual gains were made in March by every item in the castings and forgings classification.

Ferroalloy exports showed improvement during the month. Shipments of ferromanganese to foreign destinations totaled 1000 gross tons, which compares with 6 tons in February and 81 tons in March 1922. Exports of ferrosilicon also were larger, totaling 242 tons, which compares with 39 tons in the preceding month and 51 tons in March, 1922.

From a valuation standpoint a gain also is shown by the March export figures. The value of iron and steel exports, exclusive of machinery, etc., during March was $17,981,180 which compares with $14,543,155 in February.

IMPORTS AND EXPORTS
Gross Tons

	1923		1922	
	Imports	Exports	Imports	Exports
Jan.	119,955	135,046	13,404	165,962
Feb.	.....	136,853	11,535	133,333
March	.....	168,176	12,774	206,474
April	.....	.....	18,720	197,562
May	.....	.....	23,098	229,616
June	.....	.....	39,154	216,298
July	.....	.....	62,426	157,027
Aug.	.....	.....	49,054	144,264
Sept.	.....	.....	76,393	128,370
Oct.	.....	.....	184,202	131,542
Nov.	.....	.....	152,250	124,004
Dec.	.....	.....	96,358	154,087
Total	119,955	440,075	739,368	1,988,539

Year	Imports	Exports
1921	135,825	2,150,276
1920	421,274	4,934,087
1919	322,264	4,397,295
1918	169,110	5,338,019
1917	330,201	6,465,053
1916	328,965	6,110,732
1915	282,396	3,532,564
1914	289,775	1,549,554
1913	317,260	2,745,635

IRON AND STEEL EXPORTS
Gross Tons

	March		Three months ending March	
	1923	1922	1923	1922
Pig iron	2,881	2,714	8,193	3,765
Scrap	4,166	5,736	8,476	32,720
*Semifinished steel	11,412	9,678	29,710	31,815
Iron bars	1,294		6,041	
Steel bars	14,175	14,803	39,794	35,157
Alloy steel bars	213		329	
Wire rods	2,650	8,031	5,970	17,370
Boiler plate	192	2,817	2,903	4,155
Other plates	11,700	10,767	27,333	14,563
Galvanized sheets	12,372	10,065	30,361	35,203
Black sheets, steel	8,423	37,964	23,300	81,928
Black sheets, iron	755	1,163	2,456	4,541
Cold-rolled strips	1,024	849	2,704	1,320
Hoops, bands and scroll	2,071	2,340	6,301	7,195
Tin and terne plate	7,028	6,711	18,530	26,100
Struct'l shapes, plain	12,487	4,169	32,082	7,060
Struct'l shapes, fabricated	1,729	1,194	4,973	6,755
Ship and tank plates, punched and shaped	191	409	636	886
Other structural forms	2,975	4,787	8,945	12,643
Metal lath	107	**	188	**
Rails over 50 pounds	22,841	23,875	51,272	63,365
Rails under 50 pounds	1,442	1,989	5,821	6,204
Rail joints, etc.	1,759	1,338	3,731	3,135
Switches, frogs, etc.	298	235	1,398	1,436
Railroad spikes	543	642	1,663	1,478
Railroad bolts, nuts, etc	169	269	558	499
Boiler tubes	1,225	972	3,866	2,463
Casing and oil line pipe	3,653	4,975	11,725	10,859
Welded black pipe	5,757	9,706	15,870	22,333
Welded galvanized pipe	2,653	3,185	6,661	5,776
Malleable iron pipe fittings	629	527	1,524	1,857
Cast iron pipe	1,217	1,809	3,844	4,539
Cast iron pipe fittings	940	779	2,712	1,738
Plain wire	2,216	4,834	7,142	8,692
Galvanized wire	4,492	8,704	9,922	23,669
Barbed wire	6,534	4,450	16,325	9,045
Woven wire fencing	217	373	765	612
Wire cloth and screening	84	50	363	214
Wire rope and cable	488	540	1,586	1,034
Insulated wire and cable	204	76	492	327
Other wire	1,383	1,265	3,547	3,686
Cut nails	300	557	619	1,105
Horseshoe nails	160	40	307	211
Wire nails	2,051	7,059	6,314	22,032
Other nails	480	491	1,149	934
Bolts, nuts, rivets, etc.	1,947	1,968	4,578	4,223
Horseshoes	26	34	193	133
Ferromanganese and spiegel	1,000	81	1,052	392
Ferrosilicon	242	51	314	149
Other iron and steel	5,381	5,171	14,972	16,051
Total	168,176	210,242	439,810	541,367

*Includes ingots, blooms, billets, slabs and skelp.
**Due to reclassifications comparisons are not possible.

CASTINGS AND FORGINGS EXPORTS
Gross Tons

	March		Three months ending March	
	1923	1922	1923	1922
Iron castings	1,155	872	2,841	2,442
Steel castings	234	149	430	685
Car wheels and axles	1,630	1,795	3,812	4,529
Iron and steel forgings	216	179	686	453
Total	3,235	2,995	7,769	8,109

FERROALLOY EXPORTS
GROSS TONS

	March		Three months ending March	
	1923	1922	1923	1922
Ferrosilicon	242	51	314	149
Ferromanganese and spiegeleisen	1,000	81	1,052	392
Tungsten, manganese and other ores	77	.....	119	....
Ferrotungsten, tungsten metal and wire	341	14	343	14
Ferrovanadium	1	7	7	11
Other ferroalloys	1	311	327	380

Equipment Demand Still Fair

Purchases Are Being Restricted to Needs as Buyers Show Caution—Prospective Business Is Large—Many Railroad Inquiries Are Being Worked on—Tool Prices Still Are Advancing

BUYING of machine tools and shop equipment continues at a fair rate but considerable caution is being shown by users in closing on their requirements. Large orders are few, the bulk of the business being in single tools. Probably the most encouraging feature of the market is the volume of business pending in inquiries before the trade. While it is true, that the great majority of these are for single units, any number of large lists are current, and action on them is expected to develop shortly.

The railroads continue to do some buying. During the past few days the International & Great Northern closed on 10 tools. Inquiries are in the market from the Santa Fe, the New York, New Haven & Hartford, the New York city transit commission, the Central Railroad of New Jersey, the Boston Elevated railways, the Pennsylvania, the Canadian Pacific and the Canadian National railways.

General industrial demand is not as active as it was a few weeks back, due to some extent to the higher prices being quoted on machine tools. The automotive industry is not as large a buyer as it has been and it is thought this industry's needs have been fairly well filled for the present. However, during the past few days some automotive buying was reported including an order from the Ford Motor Co., Detroit. Current industrial inquiry includes one for $150,000 of equipment from the American Locomotive Co. The General Electric Co., Schenectady, N. Y., has again entered the market, the Baldwin Locomotive Works is figuring on a fairly large list, the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., continues actively in the market, as is the Youngstown Sheet & Tube Co., Youngstown, O., the United Engineering & Foundry Co. and several others. In Canada considerable interest is shown in the requirements of the Riverdale technical school at Toronto, while interest is also being shown in an inquiry just put out by the government for some equipment for the Mare Island, Cal., navy yard, which includes 40 grinders.

Crane orders are not exceptionally numerous, but the tone of the market continues good. Numerous projects are pending and crane sellers report more new inquiries are being received daily, as the shortage of labor is forcing manufacturers to purchase labor-saving equipment in an effort to maintain production.

Additional Inquiries Enliven Machinery Demand

NEW YORK, May 15.—Figures are being received by the American Locomotive Co. on approximately $150,000 of machine tools for its Schenectady, N. Y., plant. The local market is further enlivened by additional inquiries from the General Electric Co., which has recently asked bids on two radial drills, two boring mills, two grinders, one planer and several turret lathes for Schenectady, and from the New York, New Haven & Hartford, which now has a pending list of more than 30 machine tools. Included in recent items to be inquired for by the New Haven is a turret lathe. The General Electric Co., in addition to increasing its already extensive pending list, has recently closed on several machines, including turret lathes and two vertical milling machines.

Included in other active factors is the Baldwin Locomotive Works, which is figuring on considerable machine tool equipment. Recent purchases by this company include an automatic spacing punch and shear. The transit commission, New York City, is expected to come into the market in the near future for approximately $30,000 of machine tools, on which tentative figures have been asked. The equipment is for the new Lenox avenue repair shop addition. The International & Great Northern railroad has closed on about 10 machine tools, some of which went to eastern builders, and the Central railroad of New Jersey is expected to take action on a similar list this week. A substantial list is likely to be placed in the near future by the Boston elevated railways, for a new shop now under construction. The Ford Motor Co. has closed on a number of additional machines to an eastern builder for its Green island plant, near Troy, N. Y. The East St. Louis & Suburban railways, St. Louis, has closed on a car wheel lathe and the Standard Oil Co., 26 Broadway, on a 2500-pound hammer.

Price increases of the past week include advances by two leading Middlewest manufacturers of engine lathes.

An active demand for foundry equipment continues, although with one or two exceptions, individual orders have not been large. This latter is attributable to the fact new foundry construction is restricted, although much new work is in prospect. Need for increased operations in conjunction with labor shortage is the principal cause underlying the present activity in buying. A good illustration of the demand for labor-saving equipment is to be found in sand-cutting machinery, manufacturers of which are now sold ahead on an average of four months. Good demand for conveying equipment also affords another excellent example. While business in this latter line has not reached the peak of 1920, orders are numerous. The past two months in the experience of a number of crane builders, have been the most active in more than three years, and follow a period of four or five months in which demand improved substantially.

One of the largest overhead crane orders to be noted recently calls for seven 10-ton electric traveling cranes with spans ranging from 51 to 95 feet for the Hunt-Spiller Mfg. Co., Boston, this business going to the Whiting Corp. This contract was referred to in the preceding issue as

on the verge of being placed. Another Massachussetts buyer is the F. B. Smith Mfg. Co., Westfield, which closed on $5000 or $6000 of foundry equipment. The American Car & Foundry Co. has closed on a 10-ton electric crane with 100-foot span, for its Chicago plant, to the Pawling & Harnischfeger Co., and a 58-ton used electric crane, 47-foot span, for its Buffalo plant, to the Industrial Equipment Co., 149 Broadway, New York city. The American Car & Foundry Co. continues in the market for a 15-ton and a 5-ton electric crane, each with 60-foot span. A likely buyer of foundry equipment is the Reading Knob Works, Reading, Pa., which recently has completed plans for a $35,000 foundry addition.

Order Volume Is Increasing

MILWAUKEE, Wis., May 15.—Business coming to makers of and dealers in metalworking equipment is increasing after a temporary lull in activity, and buyers are more inclined to demand quick delivery. In fact, a good many sales are based on the ability of the seller to place machines in customers' hands quickly. The underlying idea among buyers seems to be that unless they can take advantage of the present active state of metal trades business quickly, they will not increase their capacity for the future, because advancing prices of production is passing along into products and the uncertainty of the effect of such a condition is arousing a feeling of caution. Locally there is a good call for new and used tools, and ouside business of manufacturers is moderately active. Makers of milling machines are using more capacity than they have for about 30 months, but they are yet a long way from capacity. Foundry business is so good that a number of new concerns are entering the field, although in some cases the new interests are formed to take over idle shops. Financing of new industries is becoming more difficult because of the position of bankers to check loans closely so as to prevent inflation.

Inquiries From Railroads Feature

CHICAGO, May 15.—Railroad inquiries continue to hold the center of interest in the Chicago machine tool market, though neither the Northwestern, the Santa Fe or the Elgin, Joliet & Eastern railroads have placed anything on the several lists they have under consideration. Action on some of this business is expected shortly. General buying is moderate in single tools or small lots. May demand promises to be light unless the latter half of the month picks up, as has been the case in a number of instances in the past. It is understood several makers of lathes will advance prices about May 15, 10 to 15 per cent. Manufacturers of turret machinery are lined up at a higher level, the advance in this class having been completed. Punch presses continue to be in demand as the product of these machines is replacing castings in many uses. They are being bought in larger lots than any other machine tools. Cranes are moving well and all makers are booking considerable orders and will be busy through the year.

Buyers Become More Cautious

BOSTON, May 15.—The recent decline in activity at some manufacturing plants in New England while considered of a temporary nature, nevertheless has had the effect of spreading caution among other manufacturing plants within the district and buying of machine tools is proceeding more conservatively than heretofore. The cotton industry particularly has experienced a slight decline and as textile mills constitute one of the chief sources for machine tool sales in New England, this decline is at once reflected in the tool and equipment market.

Crane Awards and Inquiries of the Week

Orders Placed

One 3-motor, 6-ton electric traveling crane with 25-foot span for the Crossley Machine Co., New York, to the Northern Engineering Works, Detroit.

One 3-motor, 6-ton electric traveling crane with 41-foot span for the Underwriters' Laboratory, Chicago, to the Northern Engineering Works.

One 80-ton coach hoist for the Atlantic Coast Line; four 125-ton and 10 miscellaneous cranes, from 15 tons up, to the Denver & Rio Grande Western railroad at Denver and Salt Lake; one 200-ton transfer table to the Denver & Rio Grande Western railroad; one 60-ton and one 35-ton to the Brooklyn Edison Co.; one 125-ton and one 35-ton, to the Detroit Edison Co., all to the Whiting Corp., Harvey, Ill.

One 25-ton and one 30-ton electric crane to A. Finkl & Sons, Chicago; one 20-ton and one 30-ton electric to the Standard Steel Co., Burnham, Pa.; one 10-ton electric to Joseph T. Ryerson & Son; two 20-ton and three 10-ton electric to the Milwaukee Sewage Commission; one 7½-ton bucket crane to the Pennsylvania railroad, Harrisburg, Pa.; one 10-ton electric to the Leonard Construction Co., Chicago; one 10-ton bucket crane to the Pyramid Portland Cement Co., Des Moines, Iowa; one 10-ton electric to the Wisconsin Bridge Co., Milwaukee; two 10-ton electric to the Bucyrus Co., South Milwaukee; two 15-ton electric to the Westinghouse Electric & Mfg. Co., Pittsburgh, to the Milwaukee Electric Crane & Mfg. Co.

One 2½-ton electric crane, 63-foot span, through the Immick Co., Meriden, Conn., for Packstow & Wilcox, Southington, Conn., to the Shepard Electric Crane & Hoist Co.

One locomotive crane for Elphinstone & Co., Baltimore dealer, to the Brown Hoisting Machinery Co.

One 4-ton underhung hand geared crane, 18-foot span, for the Auburn Water commission, Auburn, Me., to New Jersey Foundry & Machine Co.

One 4-ton monorail system for the American Brass Co., Ansonia, Conn., to the Shepard Electric Crane & Hoist Co.

One 3-ton electric crane, 57-foot span, for the Worth Steel Co., Claymont, Del., to the Shepard Electric Crane & Hoist Co.

One used locomotive crane for Sanderson & Porter, New York City, to an unnamed dealer.

One 25-ton locomotive crane for the Bonney Floyd Co., Columbus, O., to the McMyler Interstate Co.

One 5-ton, 1-motor crane, 26-foot span, for the Berlin Foundry & Construction Co., Berlin, N. H., to the Whiting Corp.

One used overhead electric crane for the Reading Iron Co., Reading, Pa., to an unnamed builder.

One 10-ton electric crane, 65-foot span, for the Burlington Steel Co., Hamilton, Ont., to the Shaw Electric Crane Co.

One 10-ton locomotive crane for the United Gas Improvement Co., Philadelphia, for Manchester, N. H., to the Orton & Steinbrenner Co.

One 1-ton electric crane, 60-foot span, for the Atlantic Wire Co., Branford, Conn., to the Shepard Electric Crane & Hoist Co.

One 30-ton electric crane, 45-foot span, for the Interborough Rapid Transit Co., New York City, to the Northern Engineering Works.

Two 10-ton electric cranes for the Baldwin Locomotive Works, Philadelphia; these are in addition to the 12 reported last week as placed, all going to an eastern builder. As it now stands, the order involves nine 10-ton cranes, one of 21-foot span, two of 46-foot span, and six of 56-foot span; four 40-ton cranes, 56-foot span; and one 50-ton crane, 76-foot span.

One 25-ton electric gantry crane for the Central of New Jersey railroad, to the Milwaukee Electric Crane & Mfg. Co.

One 20-ton handpower crane, 26-foot, 7½-inch span, for the Kelvin Engineering Co., 106 Front street, for shipment to Cuba, to the Roeper Crane & Hoist Works, through A. D. Granger Co., New York City.

One 4-ton electric crane, 40-foot span; one 2-ton electric crane, 30-foot span; and three 1-ton hoists for the war department, to the Hoist & Crane Engineering Co.

One 12-ton crane for Vulcan Detinning Co., Neville island, near Pittsburgh, to the Shaw Electric Crane Works, Muskegon, Mich.

One 20-ton crane for the Lorain Steel Co., Johnstown, Pa., to the Pawling & Harnischfeger Co., Milwaukee, Wis.

One 10-ton crane for the Wheeling Steel Corp., Yorkville, O., to the Shaw Electric Crane Works, Muskegon, Mich.

Orders Pending

An overhead trolley crane for the Hudson River Foundry Co., Poughkeepsie, N. Y., bids asked.

A monorail system for the Standard Oil Co. of New Jersey, 26 Broadway, New York City, bids asked.

Two single legged gantry cranes for the Chester, Pa., plant of the American Locomotive Co., bids asked; also an electric overhead crane is reported to be pending for Schenectady, N. Y.

One 15-ton locomotive crane with 70 to 80-foot boom, equipped for handling clam shell bucket, for H. R. Eicher, 608 Maloney building, Pittsburgh.

One 5-ton crane for Latrobe Electric Steel Co., Latrobe, Pa., reported last week as closed; order held in abeyance since purchaser may close on a used crane.

Four or five open-hearth cranes for new open-hearth project at Girard, O.; tentative inquiries put out by engineers.

Five cranes for sheet mill project now in formative stage; inquiry issued by Joseph Breslove, engineer, Pittsburgh.

One 3-ton crane for Westinghouse Electric & Mfg. Co., East Pittsburgh; bids being tabulated.

One 10-ton crane with three small cranes and three hoists for the H. C. Frick Coke Co., Pittsburgh; bids being tabulated.

Sales of used machinery have continued at about the same rate as during the past two or three weeks, but new tool buying has been limited to scattered sales of individual machines and an appreciable letup in inquiry is reported by nearly all dealers. Manufacturers who were asking for quotations on six or eight machines are now placing orders for one or two. A paper machine manufacturer bought several machines against a list which has been out for over a month. A shoe machine manufacturer cancelled an inquiry for several machines and bought a single upright boring machine. New England tool manufacturers are practically all operating full time and production is limited only by the scarcity of labor. Labor saving machinery continues to enjoy an urgent and widespread demand throughout the country. A Connecticut manufacturer reports having entered more orders since the first of May than for any similar period this year. Prices of tools still tend upward. One important line of lathes was advanced from 5 to 15 per cent during the week. Vertical boring machines and drill presses have also been marked up which leaves few lines which have not been advanced since the first of January.

Orders Come From Scattered Buyers

CLEVELAND, May 15.—While the volume of business being placed with tool builders and manufacturers in this district is satisfactory, individual orders are not large. Not only are orders lmited to single tools, but these come from scattered buyers, indicating, however, that demand is general. The automotive industry is not furnishing as great a demand as was the case several weeks back. However, the volume of business from this industry still is fairly large. The railroads are not placing much business with local tool builders, and but few large railroad lists are being worked on here. One list, that of the Santa Fe railroad, has attracted some attention, but according to one large machinery manufacturer, the closing date of the list is rather indefinite.

Inquiries generally are the same type as orders, that is for single tools. Here and there a large list is placed current but these are exceptions to the rule. Included in current inquiry is one from the National Products Co., East Liverpool, O., for a bending roll, a riveting machine and a radial drill.

Secondhand machinery is moving at a fair rate and appears more in demand than new machinery. Due to the fact new machine tool prices continue to show a tendency to rise, it is thought demand for used equipment will swell in volume. A number of auction sales are scheduled and at the several which have been held within the past few weeks, some fair prices were obtained.

Some Fair Inquiries Current

PITTSBURGH, May 15.—The machine tool and crane market continues quiet. However, from time to time inquiries are issued and sales are consummated which betoken a fair amount of activity. For instance, this week two crane inquiries were issued for tentative propositions involving four or five cranes each, and several single crane installations likewise are up for prices. A number of machine tool lists are pending, including the Pennsylvania railroad list for Conway, Pa., referred to last week. The United Engineering & Foundry Co. is taking bids this week on five lathes for its Frank Kneeland works, one each 18, 24 and 36-inch, and two 30-inch, all motor-driven. As revised, the inquiry drops the 72 or 84-inch lathe on which quotations originally were asked. A list is current from a western railroad for 18 tools although good used equipment may be purchased. Several other inquiries are out for one to six machines each, and one dealer reports the sale this week of a 36-inch, 10-foot, 2-head planer together with some smaller equipment; another has sold two or three motor-driven radial drills, two small and one large shaper, all for out-of-town users. The Westinghouse Electric & Mfg. Co. still is buying against its list on which dealers quoted four or five weeks ago. It is understood that the quotations received by the Youngstown Sheet & Tube Co. on its inquiry were so high as to be somewhat discouraging for the time being.

Molding machines continue to be featured in sales of foundry equipment, although one dealer reports the fitting out of a jobbing foundry in Fairmont, W. Va., with several tumbling barrels, ladles, flasks, cupola, core oven, etc. Two or three inquiries are out for sand-handling and mixing machinery as well as sand blast outfits, blowers, etc. Molding machine inquiries fairly swamp makers here, particularly since the recent exhibition in Cleveland. Included among recent orders taken by the Herman-Pneumatic Machine Co., Zelienople, Pa., are the following: Two large rollover machines for the Toledo Machine & Tool Co., Toledo, O.; three for the Commonwealth Steel Co., Granite City, Ill.; and one each for the Ohio Steel Foundry Co., Lima, O., Flockhart Foundry Co., Newark, N. J., and the American Radiator Co.

Equipment Demand Is Steady

TORONTO, Ont, May 15.—Reports from dealers and manufacturers indicate a steady demand for machinery and machine tools. Miscellaneous buying is a feature of the market, while in addition to the demand for tools in small lots, inquiry is making its appearance for some fairly large lists. Some orders are expected from the Canadian Pacific railway and the Canadian National railways for equipment for new shops now under construction. The automotive industry is a good customer and furnishes a big part of the present buying. Announcements are being made each week regarding new pulp and paper plants and power development projects, and contracts for equipment for these are being placed from time to time. The Backhus-Brooks Co., Kenora, Ont., has placed an order with the Dominion Engineering Works, Montreal, Que., for a 234-inch newsprint machine for its mill at Kenora to have a capacity of 100 tons per day.

One of the largest lists for tools recently issued is that for equipment for the Riverdale technical school at Toronto, Ont., which is expected to be closed within the next 10 days. The equipment includes 21 lathes, 14 x 6; 5 grinders, including a surface grinder, one shaper; one forging hammer; 4 drilling machines. Also full woodworking shop equipment including planers, jointers, bandsaws, surfacing machines and wood turning lathes. Large purchases of small tools will also be made. Dr. McKay, principal, Central technical school, Toronto, is handling all matters pertaining to the school.

The Sarnia Cement Products Co., Point Edward, Ont., is rebuilding its plant recently damaged by fire and will insteel three dry kilns, cupola and one 30-horsepower electric motor. Gowans-Kent, Ltd., 16 Front street east, Toronto, Ont., will erect an 8-story factory for the manufacture of glass, glass products, etc., to cost $300,000. Equipment has not been purchased. Ratepayers of Clifford, Ont., have authorized the erection of an electric plant at Elora, Ont., and are interested in equipment. Fred Blow, Acton, Ont., plans to erect a plant there to cost $10,000 to manufacture motor parts, etc. W. A. Fasken, Excelsior Life building, Toronto, Ont., is interested in prices of material and equipment necessary for the construction of a hydroelectric plant at Ka-Ka-Ka falls, on the Quinze river, northern Ontario.

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STEEL BETTERS OUTPUT MARK

Production Best in Two Years, Says the Iron Trade Review.

Further additions are being made to active iron and steel capacity and the rise of production still is the commanding feature. Operations are working close to 80 per cent, the best record in two years, says *Iron Trade*. It says:

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East of the Mississippi River

HARTFORD, Conn.—The Veeder Mfg. Co., Garden street, plans the erection of a plant at an estimated cost of $71,000.

HARTFORD, CONN.—The Molded Products Co. has been incorporated with $50,000 capital by H. B. Freeman S. N. Dunning and K. W. Terry. It has purchased the former factory of the Johns-Pratt Co.

NORWALK, CONN.—The Norwalk Pattern & Model Co. has been incorporated to make metal goods with $25,000 capital by Ira O. Gregory, D. L. McClane and M. T. Weingarten, Westport, Conn.

SOUTHINGTON, Conn.—The Peck, Stow & Wilcox Co. has let the contract for the erection of a 1-story factory building, 67 x 180 feet.

WALLINGFORD, Conn.—A 1-story plant addition, 40 x 125 feet, will be erected by the Dowd Rogers Co., manufacturer of plated metal ware. Including epuipment, the project will cost $45,000.

WASHINGTON.—The P. & A. Spark Plug Corp. has been incorporated with $1,000,000 capital stock by D. Franklin Pyle, H. W. Robertson and John T. Callaghan.

TALLAHASSEE, FLA.—The Tallahassee Iron Works plans to rebuild its plant recently damaged by fire.

TAMPA, Fla.—The Magic Electric Water Heater Co. has been incorporated with $10,000 capital stock by J. E. Phillips, Elsie A. Shirley and others.

CHAMPAIGN, Ill.—The Clifford-Jacobs Forging Co. has been incorporated with $250,000 capital stock by W. E. Clifford, D. B. Jacobs and H. S. Capron. The company is represented by Walter B. Riley, First National Bank buildinig.

CHICAGO.—Brenner,Monley & Morris, Inc., plans the erection of a plant 105 x 300 feet.

CHICAGO—The Allied Steel Products Co. has increased its capital stock from $250,000 to $350,000.

CHICAGO—The Chicago Malleable Castings Co., 1249 West 120th street, has let a contract for the erection of a 1-story building, 50 x 150 feet to cost about $25,000.

CHICAGO.—The Standard Wood Turning Co., 1750-8 West Austin avenue, plans the erection of a 2-story addition, 100 x 108 feet to cost about $40,000.

CHICAGO.—The Seng Co., 1450 Dayton street, has let the contract for the erection of a 1-story factory building, 85 x 183 feet, to cost about $45,000.

CHICAGO.—The Dryden Rubber Co., 1014 South Kildare street, plans the erection of a

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.615c
Buffalo	3.55c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Cleveland	3.36c
Detroit	3.35c
Los Angeles	3.85c
New York	3.54c
Philadelphia	3.55c
San Francisco	4.00c
Seattle	4.10c
St. Louis	3.35c
St. Paul	3.45c

IRON BARS

Boston	3.615c
Buffalo	3.50c
Chicago	3.20c
Cincinnati	3.40c to 3.50c
Detroit	3.35c
New York	3.54c
Philadelphia	3.55c
St. Louis	3.35c

SHAPES, STRUCTURAL

Boston	3.715c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Los Angeles	3.95c
New York	3.64c
Philadelphia	3.65c
San Francisco	4.10c
Seattle (large shapes)	4.20c
St. Louis	3.45c
St. Paul	3.55c

PLATES

Boston	3.715c
Boston 3/16-inch	3.04c
Buffalo	3.65c
Chicago	3.30c
Cincinnati	3.50c to 3.60c
Cleveland	3.46c
Detroit	3.45c
Detroit, 3/16-inch	3.45c
Los Angeles	3.65c
New York	3.64c
Philadelphia	3.65c
Philadelphia, 3/16-inch	3.95c
San Francisco	4.10c
Seattle	4.25c
St. Louis	3.45c
St. Paul	3.55c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.615c
Buffalo	4.30c
Chicago	4.35c
Cincinnati	4.10c
Cleveland	3.90c to 4.06c
Detroit	4.30c
Los Angeles	5.20c
New York	4.59c
Philadelphia	4.25c
San Francisco	5.00c
Seattle	5.25c
St. Louis	4.25c
St. Paul	4.60c

NO. 28 BLACK SHEETS

Boston	5.75c
Buffalo	5.10c
Chicago	5.20c
Cincinnati	4.90c
Cleveland	4.75c
Detroit	5.15c
Los Angeles	6.50c
New York	5.15c
Philadelphia	5.15c
San Francisco	6.30c
Seattle	6.25c
St. Louis	5.30c
St. Paul	5.45c

NO. 28 GALVANIZED SHEETS

Boston	6.90c
Buffalo	6.10c
Chicago	6.35c
Cincinnati	5.90c
Cleveland	5.90c
Detroit	6.30c
Los Angeles	7.30c
New York	6.15c
Philadelphia	6.25c
San Francisco	7.15c
Seattle	7.25c
St. Louis	6.10c

BANDS

Boston	4.80c
Buffalo	4.35c
Chicago	3.95c
Cincinnati	4.00c to 4.10c
Cleveland	4.01c to 4.16c
Detroit	4.10c
Los Angeles	4.60c
New York	4.39c
Philadelphia	4.35c
San Francisco	4.75c
Seattle	5.10c
St. Paul	4.20c

HOOPS

Boston	5.80c
Buffalo	4.65c
Chicago	4.55c
Cleveland	4.01c to 4.16c
Detroit	4.95c
New York	5.19c
Philadelphia, 1 inch and wider 20 gage and heavier	4.75c
Seattle	5.50c
St. Paul	4.80c

COLD ROLLED STEEL

Boston (rounds)	4.75c
Boston (shapes)	5.25c
Buffalo (rounds)	4.45c
Buffalo (shapes)	4.95c
Chicago (rounds)	4.55c
Chicago (shapes)	5.05c
Cincinnati (rounds)	4.50c
Cincinnati (shapes)	5.00c
Cleveland(rounds)	4.25c
Cleveland (shapes)	4.75c
Detroit (rounds)	4.55c
Detroit (shapes)	5.05c
Los Angeles (rounds)	5.40c
New York (rounds)	4.65c
New York (shapes)	5.15c
Philadelphia (rounds)	4.35c
Philadelphia (shapes)	4.85c
San Francisco (rounds)	5.50c
Seattle (rounds)	6.00c
St. Paul (rounds)	4.55c

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CLEVELAND

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1-story addition, 70 x 180 feet, to cost about $50,000.

CHICAGO.—The American Foundry Co. has let a contract to the Austin Co., Cleveland, for the erection of a factory building to be built at an estimated cost of $100,000.

CHICAGO.—The Roe Door & Window Co., 110 South Dearborn street, has been incorporated with $75,000 capital stock to manufacture and deal in ventilating apparatus, etc. by E. A. Bruegel, Bradley Roe, John G. McDonald. The company is represented by John G. McDonald, 110 South Dearborn street.

CHICAGO—The Catalytic Spark Plug Corp., 4026 West Lake street, has been incorporated with 600 shares of no par value, to manufacture and deal in spark plugs, etc., by C. Knox Harding, John Heckman and Richard E. Parton. The company is represented by R. E. Parton, 4026 West Lake street.

CHICAGO—The Charles L. Moyer Co., 2906 Carroll avenue, has been incorporated with $50,000 capital stock to manufacture and deal in machinery, etc., by William J. Wright, Jr., William G. Chase and Charles L. Moyer. The company is represented by Vose & Page, Marquette building.

CHICAGO—The Lightning Coin Changer Co., 112 West Adams street, has been incorporated with $150,000 capital stock to manufacture and deal in coin changing machines, etc., by P. B. Boyden, G. D. Smith and J. M. Dickinson, Jr. The company is represented by Taylor, Miller, Dickinson & Smith, Merchants Loan & Trust building.

HARTFORD CITY, Ind.—The Hartford Foundry Co. plans the erection of a 1-story plant addition, to cost about $17,000.

OSBORNE, Ind.—The plant of the Martin Oil & Refining Co. recently was damaged by fire.

FLEMINGSBURG, Ky.—The M. & F. Light & Power Co. has been incorporated with $35,000 capital stock by W. S. Fant, Sam Friend and O. H. Bright.

AUGUSTA, ME.—The Augusta Machine Shop has been incorporated with $50,000 capital by Nathan S. Weston, Norman L. Bassett and M. E. Hegarty. It will establish a shop in the vestary of the former Baptist church.

ELLSWORTH, Me.—The plant of the Ellsworth Foundry & Machine Works recently was damaged by fire.

GARDINER, Me.—The Alger Box Co. plans to rebuild the part of its plant which was damaged by fire recently.

BOSTON.—The Amory Street Foundry Co. has been organized by Bert Seabough and Arthur L. Guilfoyle, 380 Amory street, Jamaica Plain district.

BOSTON.—The Rivett Lathe & Grinder Corp. has been incorporated with $450,000 capital stock by John G. Coolidge, Brookline, Mass., Merle E. Johnson and Alfred P. Lowell.

BOSTON.—The R. Mitchell Co., brass finisher, has been incorporated with $250,000 capital stock by William G. Mitchell and Harold T. Mitchell, both of Winchester, Mass., and Clifford R. Dumble, Arlington Heights, Mass.

BOSTON—The Richard Dimes Co. has been incorporated to make metal goods with $30,000 capital by Richard Dimes, Samuel T. Dimes and Bertram F. Dimes, Winthrop, Mass.

CAMBRIDGE, Mass.—The Resisto Pipe & Valve Co. has been incorporated with $100,000 capital stock by Edward A Taft, Brookline, Mass., Bennett Sanderson, Littleton, Mass., and Henry R. Giuld, Nahant, Mass.

FALL RIVER, Mass.—The Montaup Electric Co. has been incorporated with $7,500,000 capital stock by Simeon B. Chase, Henry B. Sawyer, Roy F. Whitney and others.

FITCHBURGH, MASS.—The Simonds File Co. has let the contract for a 1-story, 60 x 75-foot factory addition.

LEXINGTON, Mass.—The Jefferson Union Corp. has been incorporated to make pipe fittings, etc., with $1,000,000 preferred stock and 10,000 shares of common stock by Charles H. Stebbins, Cambridge, Mass., Arthur W. Freeman and Edward S. Crockett.

LOWELL, MASS.—The Saco-Lowell Shops has let the contract for a 3-story and basement, 80 x 400-foot factory to cost $240,000.

LYNN, Mass.—The Lynn Screw Co., machinist, has been organized by Charles E. Godreau, George B. Godreau and Edward J. Godreau, rear of 31 Wyman street.

LYNN, Mass.—The Larson Shoe Machinery Co., Inc., has been incorporated with $75,000 capital stock by George A. Spear and Bennett P. Spear both of Swampscott, Mass., and Carl T. Banks.

READING, MASS.—The R. E. Parker Mfg. Co. has been incorporated to make metal specialties with $10,000 capital by Robert E. Parker, Herbert W. Hunt and Preston F. Nichols.

SOUTH BOSTON, MASS.—The Gillette Safety Razor Co. has let the contract for an 8-story and basement, 73 x 100-foot factory to cost $500,000.

WORCESTER, Mass.—The Auto Safety Light Co. has been incorporated to make mechanical specialities with $50,000 capital stock by Carl E. Wahlstrom, D. C. Woodbury and D. S. Nordmark, Whitinsville, Mass.

BATTLE CREEK, Mich.—The Rich Steel Products Co. plans to enlarge its plant.

DETROIT.—The Michigan Tool Co., 147 Joseph Campeau avenue, plans the erection of a 1-story addition to cost about $30,000.

DETROIT.—The Volis Precision Tool Co. has been incorporated with $100,000 capital stock to deal in micrometers, etc., by Harry Volis, 82 West Henry street, and others.

DETROIT.—The Detroit Steel Construction Co. has been incorporated with $300,000 capital stock to engage in the sale and construction of steel, by Harry C. Spillman, 3470 Iroquois avenue, Samuel Pentost and John Cober.

GRAND RAPIDS, Mich.—The Co-Ko-Cons Mfg. Co. has been formed to manufacture and sell cone making machinery, with $1000 capital stock by Edward C. Victor, 149 Auburn avenue, and others.

BALTIMORE—The Sanitary Mfg. Co., Pittsburgh, has purchased a 47-acre site here for a branch plant, costing $3,000,000.

BALTIMORE.—The J. C. M. Accelerator Co., 813 American building, has been incorporated with $50,000 capital stock by James C. Newshaw, Charles C. Carver and others.

BALTIMORE.—The Superior Steel Iron Co., Inc., 300 Tyson street, has been incorporated with $25,000 capital stock by John H. Neuman, Frederick Rosengarten and P. August Grill.

HATTIESBURG, Miss.—The Welsmech Co., foundry, has been incorporated with $30,000 capital stock by S. E. Travis Jr., R. B. McGowen and others.

JACKSON, Miss.—The Mississippi Foundry

Business Changes Recently Announced

JOSEPH T. RYERSON & SON, INC., has removed its downtown Chicago office from the Corn Exchange building to the new Illinois Merchants Bank building, Jackson and Clark streets, suite 1736. The automobile service from the downtown office to the plant will be continued.

* * *

The National Spring Co., Newcastle, Ind., has changed its name to the Trainor National Spring Co.

* * *

The Ludlum Steel Co. has moved its New York office from 2 Rector street to 33 West Forty-second street.

* * *

Notice has been received of the removal of the Link-Belt Co.'s Pittsburgh branch office from 1501 Park building to 335 Fifth avenue.

* * *

Societe Anonyme pour l'Industrie des Metaux, Lausanne, Switzerland, has taken over the aluminum and metal business of Le Mineral Societe Anonyme. The latter company will continue to trade in bauxite and chemical products. C. W. Leavitt & Co., New York, are sole selling agents in the United States for both corporations.

* * *

Cook Electric Co. has anounced the consolidation of its general offices and manufacturing departments at 2700 Southport avenue, Chicago.

* * *

The Vanadium Alloys Steel Co., W. A. Mau, Chicago district manager, has moved into its new office and warehouse at 1440 West Lake street, that city.

* * *

Herberts Machinery & Supply Co., Los Angeles and San Francisco, has been appointed exclusive sales agents in California for the Triplex Machine Tool Corp., New York.

* * *

The International High Speed Steel Co., 99 Nassau street, New York, and the E. Kaufman Co., 2 Rector street, that city, have moved their offices to 143 Liberty street, that city, where they are occupying joint offices.

Something New

Watch for It!

& Machine Co. has let a contract for the erection of a machine shop building, 60 X 160 feet, to cost about $25,000.

HAWTHORNE, N. J.—The New Jersey Valve & Fittings Co. has been incorporated to engage in a general foundry and machine shop business with a capital stock of $200,000.

NEWARK, N. J.—The Upton Iron Works, 159 West Kinney street, plans the erection of a new plant.

NEWARK, N. J.—H. M. Nelson & Co., manufacturers of machinery for heavy plate and boiler work, have purchsed additional property, adjacent, for future expansion.

NEWARK, N. J.—A large plant will be erected here by the J. R. Watkins Co. with headquarers in Winona, Minn. The proposed building will be of reinforced concrete, eight stories high.

NEWARK, N. J.—A $50,000 warehouse addition will be erected here by the Edgar T. Ward Sons Co., iron and steel products. Conveying equipment has just been purchased from the Shepard Electric Crane & Hoist Co.

TRENTON, N. J.—The Jointless Fire Brick

(*Concluded on Page* 1496)

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Mesabi Bessemer, 55 per cent iron	6.20
Old Range nonbessemer, 51½ per cent iron	5.70
Mesabi nonbessemer, 51½ per cent iron	5.55

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	10.00 to 11.00
Copper free low phosphorus 53 to 65 per cent	13.25 to 16.50

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	nominal
Algerian low phosphorus, 52 to 54 per cent	nominal
Swedish and Norwegian low phosphorus, 68 per cent	nominal
Swedish foundry or basic, 66 to 68 per cent	9.50 to 10.50
Spanish foundry or basic, 50 to 54 per cent	9.00 to 10.00

Manganese Ore

Prices do not include duty at rate 1 per cent per pound of metallic manganesese contained.

Brazilian, minimum 47 per cent ..... 43½ cents c.i.f. tidewater

Indian, minimum 47 per cent ..... nominal

Caucasian, 53 to 55 per cent ..... 46½ to 48 cents c.i.f. tidewater

Fluor Spar

85 and 5% grade

Washed gravel, Kentucky and Illinois mines, per ton (nominal) .. $21.50

Rivets

Structural rivets, Pittsburgh	3.25c
Boiler rivets, Pittsburgh	3.35c
Rivets, 7/16-in. and smaller	60 and 5 off

Nuts and Bolts

NUTS

(Up to 1¼ and 1⅛ inches inclusive)

Hot pressed square or hexagon blank	$3.00 off list
Hot pressed square or hexagon tapped	$2.75 off list
Cold punched square or hexagon blank	$3.00 off ilst
Cold punched, square or hexagon, tapped	$2.75 off list
Cold punched semifinished hexagon nuts ⅜-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS

(⅜ x 6 inches, smaller and shorter)

Rolled thread	45 off
Cut thread	40 off
Larger and longer	40 off

MACHINE BOLTS

(⅜ x 4 inches, hot pressed nuts)

Rolled thread	50 off
Cut thread	40-10 off
Larger and longer	40-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	35-5 off
Larger and longer	35-5 off
Lag screws	50 off
Plow bolts Nos. 1, 2 and 3 heads	40-10 off
4 to 10 heads	40-10+20 off
Stove bolts	75-5 off
Tap bolts	25 off
Bolt ends with hot pressed nuts	40-10 off
Bolt ends with cold punched nuts	35-5 off
Blank bolts	40 off
Rough stud bolts with nuts	40 off

WASHERS

Wrought washers ..... $4.85 to $5.00

Steel Pipe

(First column*—effective March 19, 1923)
(Second column—effective April 19, 1923)
*Wheeling Steel Corp. discounts.
Pittsburgh basing discounts, jobbers' carloads.

	Butt Weld Black	Galvanized
⅛-inch	44 to 45	18½ to 19½
¼ and ⅜-inch	50 to 51	24½ to 25½
½-inch	55 to 56	41½ to 42½
¾-inch	59 to 60	47½ to 48½
1 to 3-inch	61 to 62	49½ to 50½
Lap Weld		
2-inch	54 to 55	42½ to 43½
2½ to 6-inch	58 to 59	46½ to 47½
7 to 8-inch	55 to 56	42½ to 43½
9 and 10-inch	54 to 54	41½ to 41½
11 and 12-inch	54 to 53	41½ to 40½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	59 to 60	47½ to 48½
Lap Weld		
2-inch	52 to 53	40½ to 41½
2½ to 6-inch	56 to 57	44½ to 45½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	40 to 41	23½ to 24½
¼ and ⅜-inch	46 to 47	29½ to 30½
½-inch	52 to 53	41½ to 42½
¾-inch	57 to 58	46½ to 47½
1 to 1½-inch	59 to 60	48½ to 49½
2 to 3-inch	60 to 61	49½ to 50½
Lap Weld		
2-inch	52 to 53	41½ to 42½
2½ to 4-inch	56 to 57	45½ to 46½
4½ to 6-inch	55 to 56	44½ to 45½
7 to 8-inch	51 to 52	38½ to 39½
9 and 10-inch	45 to 45	32½ to 32½
11 and 12-inch	45 to 44	32½ to 31½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	41 to 42	31½ to 32½
¾ to 1½-inch	44 to 45	34½ to 35½
2 to 2½-inch	46 to 47	36½ to 37½
Lap Weld		
2-inch	40 to 41	31½ to 32½
2½ to 4-inch	42 to 43	33½ to 34½
4½ to 6-inch	41 to 42	32½ to 33½
7 to 8-inch	37 to 38	24½ to 25½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers carloads

THREADS AND COUPLINGS	Butt Weld Black	Galvanized
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	41	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

	Butt Weld	
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL (Lap welded)

(Effective April 19, 1923)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

(Effective April 12, 1923)

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN

(Effective April 19, 1923)

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT ROLLED

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras: ....

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	83 off
Carbon, 0.30 to 0.40 per cent	81 off
Carbon, 0.40 to 0.50 per cent	80 off

Plus differentials and extras for cutting

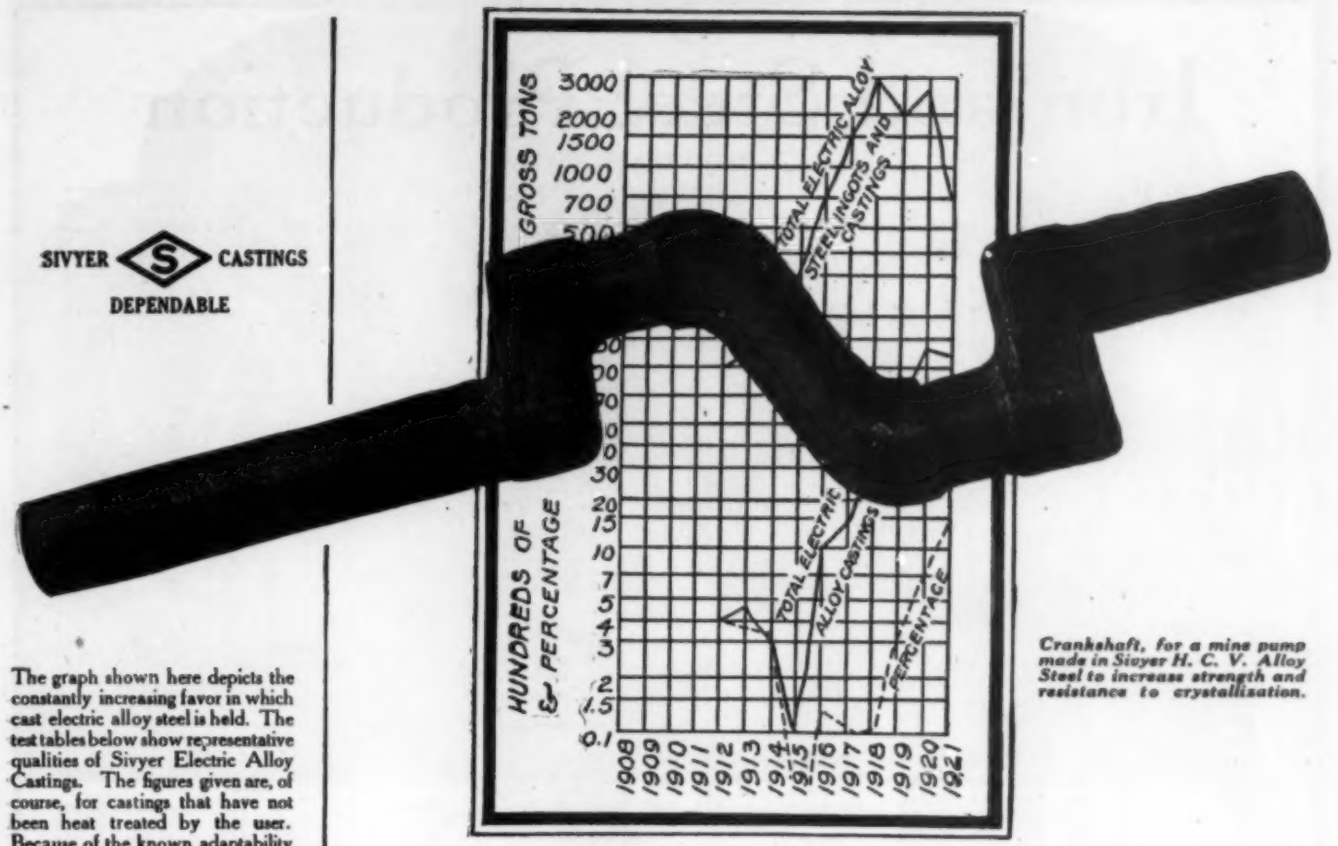
SEAMLESS STEEL LOCOMOTIVE AND SUPER-HEATER TUBES

(Effective April 19, 1923)

Outside diameter	Gage	Net prices per foot, f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5½-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

SIVYER (S) CASTINGS
DEPENDABLE



Crankshaft, for a mine pump made in Sivyer H. C. V. Alloy Steel to increase strength and resistance to crystallisation.

The graph shown here depicts the constantly increasing favor in which cast electric alloy steel is held. The test tables below show representative qualities of Sivyer Electric Alloy Castings. The figures given are, of course, for castings that have not been heat treated by the user. Because of the known adaptability of all alloy and high carbon steels to heat treatment, these test figures show large increases after the castings have been properly processed.

Sivyer Vanadium Electric Furnace Steel Representative Properties —Annealed Castings.

Tensile Strength...85,000 lbs.
Elastic Limit.....48,000 "
Elongation in 2".....24%
Reduction in Area.....28%

Sivyer Nickel Electric Furnace Steel Representative Properties —Annealed Castings.

Tensile Strength....95,000 lbs.
Elastic Limit.....55,000 "
Elongation in 2".....25%
Reduction in Area.....30%

Sivyer Chrome Electric Furnace Steel Representative Properties —Annealed Castings.

Tensile Strength...95,000 lbs.
Elastic Limit.....50,000 "
Elongation in 2".....20%
Reduction in Area.....25%

Sivyer HI Carbon Electric Furnace Steel Representative Properties —Annealed Castings.

Tensile Strength...80,000 lbs.
Elastic Limit.....45,000 "
Elongation in 2".....20%
Reduction in Area.....24%

Increasing the use of alloy castings in mining machinery

THE Sivyer casting shown here illustrates some of the outstanding reasons for the increasing use of cast electric alloy steel in mining machinery. The manufacturer for whom Sivyer High Carbon Vanadium crankshafts are made found that the machining costs of hammered forgings were high. He did not believe, however, that any cast steel could stand the alternating stresses and strains of crankshaft service. He finally had some Sivyer H. C. V. castings made and tested. Their physical superiority and low machining cost offered such decided advantages that he now uses connecting rods and certain other parts made in this superior electric alloy.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	—Output— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,888	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	424	311	3,547,012	118,233

Ingots and Castings

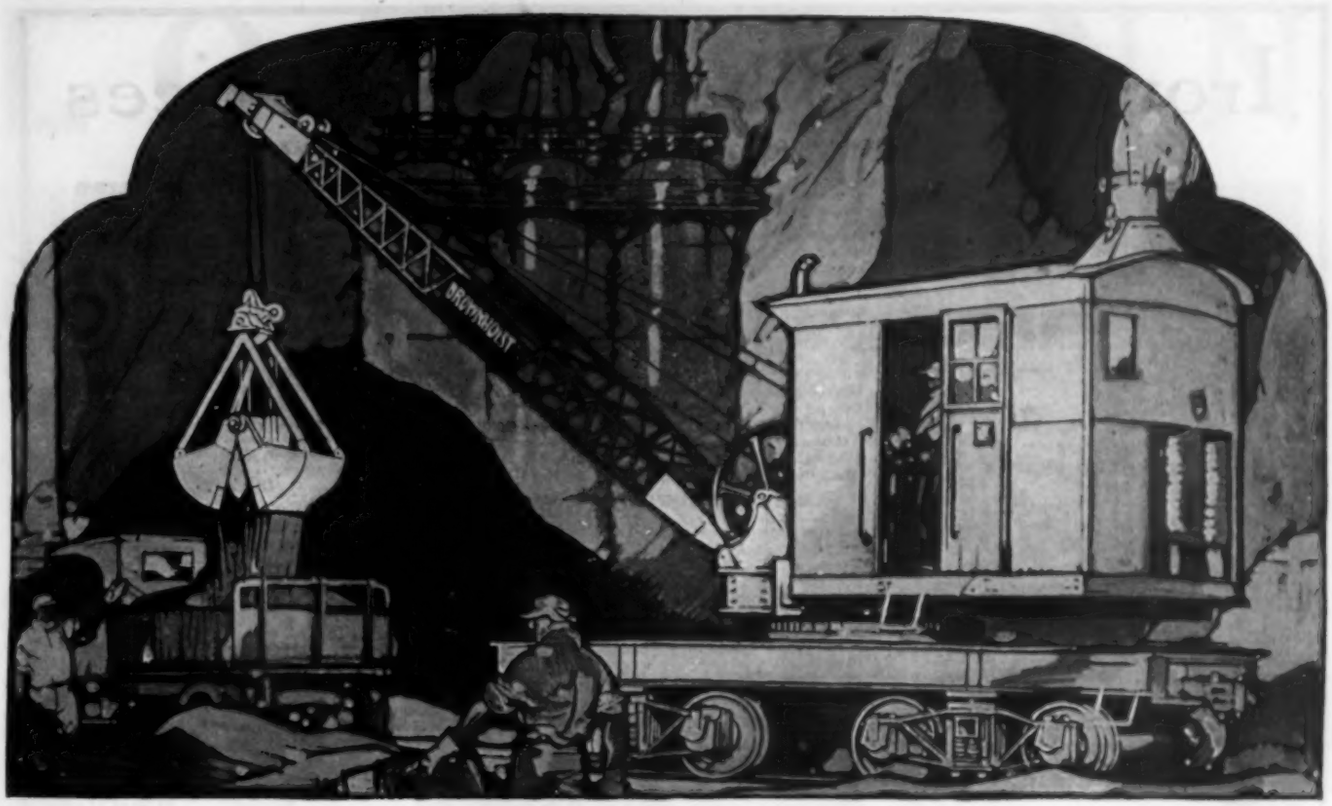
By American Iron and Steel Institute

	Ingots	Castings	Total
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797

Monthly Ingot Output

Gross Tons

1922	84.13 per cent of capacity	Indicated total
January	1,593,482	1,890,000
February	1,745,022	2,070,000
March	2,370,751	2,820,000
April	2,444,513	2,910,000
May	2,711,141	3,220,000
June	2,634,477	3,130,000
July	2,487,104	2,960,000
August	2,214,582	2,630,000
September	2,373,779	2,820,000
October	2,872,415	3,410,000
November	2,889,297	3,440,000
December	2,779,890	3,300,000
Total	29,116,453	34,600,000
1923		
January	3,251,694	3,860,000
February	2,919,017	3,460,000
March	3,402,007	4,040,000
April	3,321,278	3,950,000



Brownhoist No. 2 Crane mounted on 8-wheel trucks

A Better Small Crane Because It Has 8-Wheel Trucks

Hundreds of industrial plants and railroad yards can materially cut their handling costs with this new No. 2 Eight-Wheel Brownhoist Crane.

The benefits which come from eight wheel truck construction are generally available only in larger capacity cranes. Eight wheel trucks provide greater switching efficiency, easier handling on curves, more stability and reduce track wear.

To those crane users who do not require vast handling capacity, this small crane offers all the advantages of larger equipment and—at considerably lower cost.

Brownhoist Products

Heavy Dock Machinery
Locomotive Cranes
Monorail Trolleys
Concrete Bunkers
Chain Conveyors
Belt Conveyors
Coal Crushers
Bridge Cranes
Buckets, etc.

The Brown Hoisting Machinery Co., *Cleveland, O.*

Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans

BROWNHOIST

M'ATERIAL HANDLING EQUIPMENT

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$17.50 to 18.00
Boston (dealers)	16.00 to 16.50
Buffalo	21.50 to 22.50
Chicago	19.00 to 19.50
Cleveland	22.25 to 22.50
Cincinnati	19.50 to 20.00
Detroit (dealers)	20.00 to 20.50
Eastern Pennsylvania	19.50 to 20.50
New York (dealers)	16.00 to 16.50
Pittsburgh	22.50 to 23.00
St. Louis	19.00 to 19.50
Valleys (nominal)	22.50 to 23.00
No. 1 railroad steel New York (dealers)	16.00 to 16.50

BUNDLED SHEETS

Buffalo	$16.25 to 16.75
Cleveland	13.00 to 13.25
Cincinnati	15.50 to 16.00
Detroit	16.00 to 16.50
Eastern Pennsylvania	18.50 to 19.50
Pittsburgh	19.50 to 20.00
St. Louis	14.50 to 16.00
Valleys	17.50 to 18.00

STEEL RAILS, SHORT

Birmingham	$19.00 to 20.00
Boston (dealers)	17.00 to 18.00
Chicago	23.00 to 23.50
Cincinnati	24.50 to 25.50
Cleveland	21.00 to 21.50
St. Louis	22.50 to 23.00

STOVE PLATE

Birmingham	18.50 to 20.00
Boston	19.00 to 19.50
Buffalo	20.00 to 21.00
Chicago	19.00 to 19.50
Cincinnati (net tons)	14.00 to 14.50
Cleveland	21.00 to 21.50
Detroit (net ton) (dealers)	18.00 to 18.50
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	15.50 to 16.00
Pittsburgh	18.50 to 19.00
St. Louis	19.00 to 19.50

LOW PHOSPHORUS

Buffalo	26.00 to 27.00
Cincinnati	20.50 to 21.50
Eastern Pennsylvania	29.00 to 30.00
Pitts. billets and bloom crops	28.50 to 29.00

SHOVELING STEEL

Chicago	18.75 to 19.25
Pittsburgh	19.50 to 20.00
St. Louis	18.00 to 18.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	24.50 to 25.00
Eastern Pennsylvania	27.00 to 29.00
Pittsburgh	25.00 to 25.50
St. Louis	25.50 to 26.00

COMPRESSED SHEETS

Buffalo	19.50 to 20.50
Chicago	17.50 to 18.00
Pittsburgh	21.50 to 22.00
Cleveland	20.75 to 21.25
Detroit (dealers)	19.00 to 19.50
Valleys (nominal)	22.00 to 22.50

FROGS, SWITCHES, GUARDS

Chicago	19.00 to 19.50
Eastern Pennsylvania	19.50 to 20.50
St. Louis	20.00 to 20.50

BOILER PLATE, CUT

St. Louis (dealers)	14.00 to 14.50

ANGLE BARS—STEEL

Chicago	21.00 to 21.50
St. Louis	21.00 to 21.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	19.50 to 20.00
Boston (dealers)	19.00 to 20.00
Buffalo	20.00 to 21.00
Chicago, No. 1	19.25 to 19.75
Chicago, No. 2	19.00 to 19.50
Cincinnati No. 1	18.00 to 18.50
Eastern Pennsylvania, No. 1	24.00 to 25.00
Pittsburgh No. 1	22.50 to 23.00
Pittsburgh No. 2	22.50 to 23.00
New York, No. 1 (dealers)	20.75 to 21.25
St. Louis, No. 1	19.50 to 20.00
St. Louis, No. 2	19.00 to 19.50

WROUGHT PIPE

Boston (dealers)	13.00 to 13.50
Buffalo	17.00 to 18.00
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	13.00 to 13.50

YARD WROUGHT

Boston	17.00 to 18.00
Eastern Pennsylvania	22.50 to 23.00

CITY WROUGHT

New York, long	$18.00 to 18.50

BUSHELING

Buffalo, No. 1	19.00 to 20.00
Chicago, No. 1	19.00 to 19.50
Chicago, No. 2	14.00 to 14.50
Cincinnati No. 1	15.50 to 16.50
Cleveland, No. 1	17.00 to 17.25
Cleveland, No. 2	15.00 to 15.50
Detroit, No. 1	17.00 to 17.50
Detroit No. 2 (new)	14.00 to 15.00
Detroit, No. 2 (old)	13.00 to 14.00
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh, No. 1	19.00 to 19.50
St. Louis, No. 1	18.50 to 19.00

MACHINE SHOP TURNINGS

Birmingham	$12.00 to 13.00
Boston (dealers)	14.00 to 14.50
Buffalo	17.50 to 18.00
Chicago	14.00 to 14.50
Cleveland	17.25 to 17.50
Cincinnati (net ton)	13.00 to 13.50
Detroit (dealers)	15.00 to 15.50
Eastern Pennsylvania	18.00 to 19.00
New York (dealers)	16.00 to 16.50
Pittsburgh, No. 1	19.00 to 19.50
St. Louis	14.00 to 14.50
Valleys	17.00 to 17.50

CAST IRON BORINGS

Birmingham (chemical)	16.50 to 17.00
Birmingham borings (plain)	12.00 to 13.00
Boston (chemical)	18.00 to 19.00
Boston (dealers)	14.00 to 14.50
Buffalo	19.00 to 20.00
Chicago	16.50 to 17.00
Cincinnati (net tons)	14.00 to 14.50
Cleveland	17.50 to 17.75
Detroit (dealers)	15.50 to 16.00
Eastern Pennsylvania	19.00 to 20.00
Eastern Pennsylvania (chem.)	22.00 to 24.00
Pittsburgh	20.00 to 20.50
New York (dealers' price)	15.50 to 16.00
St. Louis	15.50 to 16.00
Valleys	19.50 to 19.75

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	14.00 to 14.50
Cleveland	17.25 to 17.50
Detroit (dealers)	15.00 to 15.50
Eastern Pennsylvania	18.00 to 19.50
New York (dealers)	14.00 to 14.50

IRON AXLES

Birmingham	29.00 to 30.00
Boston (consumers)	31.00 to 32.00
Buffalo	30.00 to 31.00
Chicago	32.00 to 32.50
Cincinnati	28.00 to 29.00
Eastern Pennsylvania	35.00 to 38.00
New York (dealers)	29.00 to 30.00
St. Louis	30.50 to 31.00

IRON RAILS

Buffalo	$23.00 to 23.50
Chicago	23.00 to 23.50
Cincinnati	17.50 to 18.00
St. Louis	20.00 to 20.50

PIPES AND FLUES

Chicago	14.50 to 15.00
Cincinnati	13.50 to 14.00
Cleveland	16.00 to 16.50
St. Louis	14.50 to 15.00

RAILROAD GRATE BARS

Buffalo	18.00 to 19.00
Chicago	18.00 to 18.50
Cleveland	21.00 to 21.50
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	17.00 to 17.50
St. Louis	18.00 to 18.50

FORGE FLASHINGS

Boston (dealers)	14.50 to 15.00
Chicago, small	17.00 to 17.50
Cleveland, small	19.50 to 19.75
Cleveland, large	19.50 to 19.75
Detroit (dealers)	16.00 to 16.50

FORGE SCRAP

Boston (dealers)	14.00 to 14.50
Chicago	19.00 to 19.50
Eastern Pennsylvania	18.50 to 19.50

ARCH BARS AND TRANSOMS

Chicago	26.50 to 27.00
St. Louis	26.00 to 26.50

ANGLE BARS—IRON

Chicago	26.50 to 27.00
St. Louis	25.50 to 26.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	15.00 to 15.50
Buffalo	22.50 to 23.00
Chicago	18.00 to 18.50
Cleveland	19.00 to 19.25
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	21.50 to 22.00
St. Louis	16.00 to 16.50

STEEL CAR AXLES

Birmingham	25.00 to 27.00
Boston (consumers)	27.00 to 28.00
Buffalo	24.50 to 25.50
Chicago	25.25 to 25.75
Cleveland	30.00 to 31.00
Eastern Pennsylvania	27.00 to 28.00
New York (dealers)	22.00 to 23.00
Pittsburgh	25.50 to 26.00
St. Louis	26.00 to 26.50

SHAFTING

Boston (consumers)	26.00 to 27.00
Chicago	25.25 to 25.75
Eastern Pennsylvania	26.00 to 28.00
New York (dealers)	21.00 to 21.50
St. Louis	24.00 to 24.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	$23.50 to 24.00
Birmingham, iron	23.00 to 24.50
Boston (consumers)	26.00 to 27.00
Buffalo, iron	21.00 to 22.00
Chicago, iron	24.00 to 24.50
Cincinnati	19.50 to 20.00
Eastern Pennsylvania	25.00 to 26.00
New York iron (dealers)	22.50 to 23.50
Pittsburgh, iron	25.00 to 25.50
Pittsburgh, steel	25.00 to 25.50
St. Louis, iron	24.00 to 24.50

NO. 1 CAST SCRAP

Birmingham, cupola	23.00 to 25.00
Boston (consumers)	26.00 to 27.00
Buffalo	23.00 to 24.00
Chicago, cupola	24.00 to 24.50
Cincinnati, No. 1, machinery, cupola (net ton)	24.00 to 24.50
Cleveland, cupola	27.00 to 28.00
Detroit (net ton) (dealers)	22.00 to 22.50
Eastern Pennsylvania, cupola	25.00 to 27.00
New York, cupola (dealers)	24.00 to 26.00
Pittsburgh, cupola	25.50 to 26.00
San Francisco	26.00 to 28.00
St. Louis, agricultural	23.00 to 23.50
St. Louis, railroad	23.00 to 23.50
Valleys	27.00 to 27.50

HEAVY CAST

Boston (consumers)	23.00 to 24.00
Buffalo	18.00 to 19.00
Cleveland	20.00 to 20.50
Detroit automobile (net ton)	26.00 to 27.00
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	20.00 to 21.00
Pittsburgh	22.50 to 23.00

MALLEABLE

Boston (railroad) (consumers)	26.00 to 27.00
Buffalo	24.00 to 25.00
Chicago, railroad	26.00 to 26.50
Chicago, agricultural	24.00 to 24.50
Cincinnati, agricultural	20.50 to 21.50
Cincinnati, railroad	22.00 to 22.50
Cleveland, agricultural	27.00 to 28.00
Cleveland, railroad, nominal	28.50 to 29.00
Detroit (dealers)	24.00 to 25.50
Eastern Pennsylvania, railroad	22.00 to 23.00
Pittsburgh, railroad	25.00 to 25.50
St. Louis, agricultural	22.00 to 22.50
St. Louis, railroad	23.25 to 23.75

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	20.00 to 21.00
Boston (dealers)	18.50 to 19.00
Chicago	21.00 to 21.50
Cleveland	24.00 to 24.50
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	20.00 to 20.50
Pittsburgh district	26.00 to 26.50
St. Louis	20.50 to 21.00

LOCOMOTIVE TIRES

Chicago	20.75 to 21.25
St. Louis	21.50 to 22.00

LOW PHOSPHORUS PUNCHINGS

Chicago	21.50 to 22.00
Eastern Pennsylvania	26.00 to 28.00
Pittsburgh	27.50 to 28.00

LOGEMANN

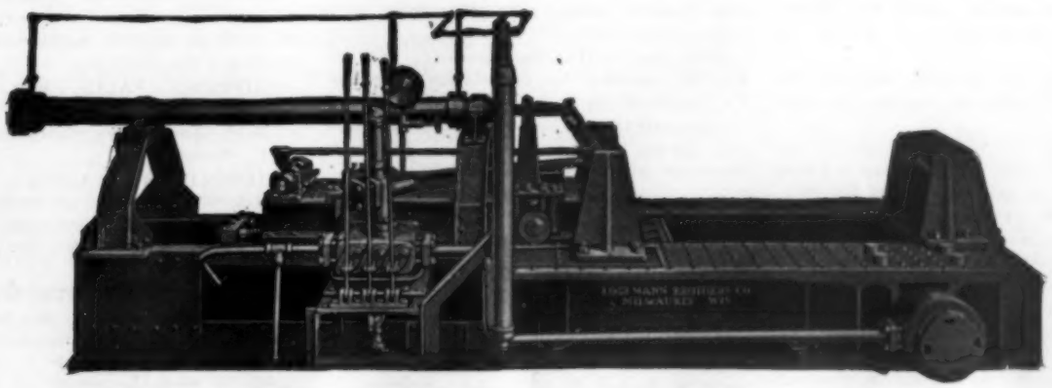
Double Ram Hydraulic
Scrap-Metal Presses

STANDARD
In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
Compare this with prices paid for "hydraulic-compressed."

LOGEMANN BROTHERS CO., 3126 Burleigh St. MILWAUKEE, WIS.



We build Balers for All Purposes

Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades.

Also Hydraulic Shaft Straighteners, Etc.

East of the Mississippi

(*Concluded from Page* 1490)

Co., Steele street, plans to enlarge its plant here.

ALBANY, N. Y.—A $25,000 plant addition will be erected by the Brockway Motor Truck Company.

ALBANY, N. Y.—The Albany Hi-Grade Steel Corp. has been incorporated with $30,050 capital stock by D. A. Bruce, E. E. Ross and W. T. Bell. The company is represented by Gawley & Duncan.

BROOKLYN, N. Y.—The Brooklyn Edison Co., 360 Pearl street, plans the erection of a 1-story power house, 51 x 80 feet.

BROOKLYN, N. Y.—A $30,000 plant addition will be erected by the Buckingham Steel Co., 5714 Second avenue. The proposed structure will be 2-stories, 120 x 124 feet.

BROOKLYN, N. Y.—The Eastern Tube & Steel Corp. has been incorporated with $450,000 capital stock by E. W. Blunt, C. J. and H. W. Thompson. It will acquire the business of the Empire Tube & Steel Corp., College Point, L. I.

CORNWALL, N. Y.—Part of the power house of the Cornwall Chemical Co. recently was damaged by fire.

GREAT NECK, N. Y.—The Little Fireplace Heater Co. recently was incorporated with $40,000 capital stock by J. H. Hassinger, H. Litt and C. Moise. The company is represented by G. W. Elkins, 34 Pine street, New York.

JAMESTOWN, N. Y.—The Seaburg Mfg. Co., Steele street, plans to enlarge its plant by the erection of an addition.

LONG ISLAND CITY, N. Y.—The Prest-O-Lite Co., Inc., has sold its 1-story plant here to Henry Schultz, manufacturer of ice cream refrigerators.

NEW YORK.—The plant of the Whitall-Tatum Co., 46 Barclay street, recently was damaged by fire.

NEW YORK.—The Atlas Novelty Co., 722 East Eleventh street, has awarded a contract for the erection of a 2-story factory building, 40 x 112 feet.

NEW YORK.—The Meltzer Steel Co. has been incorporated with $25,000 capital stock by M. Meltzer, B. Cohen, and E. Breidenbach. The company is represented by B. Klaber, 342 Madison avenue.

PERRYVILLE, N. Y.—The plant of the Worlock Stone Crushing Co. recently was damaged by fire.

ROCHESTER, N. Y.—The Rochester Gas & Electric Corp. plans the erection of a 1-story power house at an estimated cost of $50,000.

ROME, N. Y.—The Manufacturers' Power Co. plans the construction of a new power house at an estimated cost of $110,000.

SCHENECTADY, N. Y.—The Adirondack Power & Light Corp. plans to construct a plant near Dolgeville, N. Y.

YONKERS, N. Y.—Following the recent announcement by W. D. E. Baldwin, chairman, that the Otis Elevator Co., contemplated extensions at its various plants, a contract has been awarded John T. Kelley, for the erection of a 1-story, 120-foot addition to the Otis plant in this city. Including the equipment, the project will cost about $150,000.

ANDREWS, N. C.—A $450,000 municipal electric generating station will be erected here on the Hiawassee river.

FAYETTEVILLE, N. C.—The Carolina Power Co. will erect an electric power plant.

LEGGETTS, N. C.—The Leggetts Electric Co. has been incorporated with $15,000 capital stock by Theodore Fountain and others.

AKRON, O.—The Summit Fender & Body Co. has been incorporated with $10,000 capital stock by R. K. Schieb, H. C. Averill, M. D. Wright, Louellia Averill and M. E. Schieb.

CLEVELAND.—The Buckeye Belting & Supply Co .has increased its capital stock from $20,000 to $50,000.

CLEVELAND.—The Steelcraft Parts Co. has been incorporated with $100,000 capital stock by Frank T. Cullitan, A. M. Franklin, P. J. Daley, M. J. Grdina and L. M. Laurienzo.

COLUMBUS, O.—The Quad Stove Co. plans the erection of a plant addition, 38 x 140 feet.

DAYTON, O.—The Citizens Auto Parts Co. has been incorporated with $25,000 capital stock by Jesse J. Jacobs, Samuel L. Finn, G. E. Miller, Rowland H. McKee and Carol Deis.

DEFIANCE, O.—A machine shop building, 44 x 100 feet, will be built by E. G. Kind and C. L. Fink.

DEFIANCE, O.—The Kruse-Wierk Mfg. Co. has been incorporated with $50,000 capital stock to make sheet metal containers. It is erecting a plant here.

KENT, O.—The Lamson & Sessions Co., Cleveland, has purchased the cotter and flat spring key business of J. H. Williams.

LIMA, O.—The plant of the Ohio Steel Foundry Co. recently was damaged by fire

POMEROY, O.—The J. M. Crawford Foundry Co. plans the erection of as addition, 60 x 90 feet.

DANVILLE, Pa.—The Danville Galvanizing Co., recently organized, plans to establish a plant for the manufacture of galvanized metal products.

GETTYSBURG, Pa.—The Gettysburg Ice & Storage Co., will add a large addition to its ice plant.

MEADVILLE, Pa.—The Champion Tool Co., Pine street, plans the erection of a plant addition at an estimated cost of $100,000.

MONONGAHELA, Pa.—The Liggett Spring & Axle Co. plans to install some additonal equipment.

NORRISTOWN, Pa.—Part of the plant of the Norristown Iron & Steel Co. recently was damaged by fire. It will be rebuilt.

PHILADELPHIA.—The Largman-Gray Co., 3360 Frankfort street, plans the erection of a 1-story power house.

PHILADELPHIA.—Approximately $40,000 will be expended by the Garrett Buchanan Co. for alterations to its warehouse.

PHILADELPHIA.—The plants of the Keystone Spring Works and the Samson Pattern & Model Co. recently were damaged by fire.

PHILADELPHIA—The Phil-Fibre Boxboard Mills Co. has awarded a contract to Lewis Rosengarten for a $10,000 warehouse.

PHILADELPHIA—Plans are being prepared by John J. Carroll, architect, for a 2-story garage and repair station, 70 x 90 feet, for Ralph W. Fisher.

PHILADELPHIA.—Plans are being prepared by Samuel D. Miller for a $30,000 machine shop for a company, whose name for the the present is withheld.

PHILADELPHIA.—General contract for the erection of a $500,000 plant for the American Bag & Paper Co., has been awarded the Work Company.

PHILADELPHIA—George Kessler Contracting Co. has a contract for a $20,000 addition to the plant of the Excelsior Wagon Works.

PHILADELPHIA—A $500,000 cold storage warehouse will be erected here by the American Storage Co. Plans call for a 6-story building, 200 x 211 feet. Alfred B. Kister is general contractor.

PHILADELPHIA—A $250,000 plant will be erected here by J. L. Ketterlinus. The structure will be eight stories, of reinforced concrete. The Ballinger Co. is architect in charge and the Turner Construction Co., general contractor.

PITTSBURGH.—The Martin-Hartscog Co. has awarded D. T. Riffle a contract to erect a brick machine shop at 918 Reddale street, at an estimated cost of $26,800.

PITTSBURGH.—The Vitro Mfg. Co., Bessemer building, has awarded a contract for the erection of a factory building at Chartiers avenue and Cliffe street, to be built at an estimated cost of $10,000.

READING, PA.—Approximately $80,000 will be expended by the Biehl Wagon Works, auto body builders, on a new plant.

REYNOLDSVILLE, PA.—A large tract at Rathmel, near here, has been purchased by the E. I. Du Pont de Nemours Co. as a site for five storage buildings.

ROSSMORE, Pa.—The Rowe-Stuart Motors Corp. plans to rebuild the part of its plant recently damaged by fire.

SCOTTDALE, Pa.—The plant of the United States Cast Iron Pipe & Foundry Co. recently was damaged by fire.

GREENVILLE, S. C.—The Starnes Farm Light & Pump Co. has been incorporated by R. E. Starnes, W. L. Matheney and others.

GREENVILLE, S. C.—The Duncan Mills Co., has increased its capital $600,000 to provide funds for additions and equipment at its cotton mill.

GREENVILLE, S. C.—The Morgan Barr Electric Co. has been incorporated with $10,000 capital stock by George D. Barr, G. R. Morgan and others.

CHATTANOOGA, Tenn.—The Tennessee Electric Power Co. plans several improvements to its plant.

CHARLOTTESVILLE, Va.—The Blue Ridge Electric Co. has been incorporated with $10,000 capital stock by C. W. Cabell, S. Garland and others.

RICHMOND, Va.—The Apex Machine Mfg. Co. has been incorporated with $50,000 capital stock by Luther R. Bivens, W. C. Northam and others.

BERLIN, WIS.—The Schaefer Mfg. Co., manufacturer of canning factory machinery, will build a $25,000 machine shop and assembling room addition.

CHIPPEWA FALLS, WIS.—A machine and forge shop, 45 x 90 feet, will be built at 16-18 West Willow street for the use of A. P. Hauptmann.

HILBERT, WIS.—Architects Oppenhamer & Obel, Wausau, Wis., are drawing plans for a public garage and sales room, with service shop, costing $25,000, for Dr. C. F. Lawler, Hilbert.

JANESVILLE, WIS.—The Stoughton Wagon Co., Stoughton, Wis., has leased a large building here and will manufacture commercial car bodies at the rate of 200 to 300 a month to meet the output of light delivery trucks by the local plant of the Chevrolet Motor Co. C. H. Cox, of the Fisher Body Corp., has been named manager of the new shop.

MADISON, WIS.—Bids will be opened May 18 for a garage and machine shop for the Capital Garage Co. at East Washington and Blair streets, costing $60,000. A. Hult is president.

SHEBOYGAN, WIS.—A 2-story fireproof building, 60 x 120 feet, will be erected by Verhulst Bros., local contractors, for the Hensel Yellow Cab Co. as its headquarters. With service machinery the plant will cost $35,000.